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Revision of the *Idteidæ*, a Family of Sessile-eyed Crustacea.
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(PLATES I.—III.)

IN the account now laid before the Society of this interesting group I have, as in previous memoirs*, restricted myself to the endeavour to elucidate the classification, definition, and distribution of the genera and species, which had become greatly confused in consequence of the large additions to the literature of recent years. Hence, it appeared, a revision was urgently needed.

*Introductory Remarks on the History and Classification of the
Idoteidæ.*

Little need be said, by way of introduction, regarding the classifications employed by the earlier authors (such, for instance, as Leach†, Desmarest‡, and Risso§), since the types with which they were acquainted were but few, and the definitions of the generic divisions employed by them are not generally of sufficient importance to allow of their employment in a natural system of classification.

* Revision of the *Hippidea* in Journ. Linn. Soc. Zool. xiv. pp. 312-336 (1878).
On the *Squillidæ*, Ann. & Mag. Nat. Hist. (ser. 5) v. pp. 1 and 108 (1880).

† Trans. Linn. Soc. xi. pp. 353, 364 (1815).

‡ 'Considérations générales sur les Crustacés,' p. 288 (1825).

§ 'Hist. naturelle de l'Europe méridionale,' v. p. 107 (1826).

Latreille, in 1829*, divided the Isopoda into six sections, and included in his fourth section (*Idotéides*, Leach) the three genera *Idotea*, *Stenosoma*, and *Arcturus*.

Milne-Edwards, in 1840†, in his great work, united under the designation *Idotéides* the three genera *Arcturus*, *Idotea*, and *Anthura*, including in *Idotea* the various genera proposed by Leach and Risso, and placed *Idotea* and *Anthura* in his subtribe *Idotéides ordinaires*. As, however, Harger has recently shown, *Idotea* has in reality a much closer affinity with *Arcturus* than with *Anthura*. The sectional divisions adopted by Milne-Edwards, based upon the number of postabdominal segments and the structure of the epimera, afforded excellent characters for distinguishing the species in the then existing state of carcinological knowledge.

But fifteen species are enumerated by Milne-Edwards, and of these several are now shown to have been based upon characters insufficient to distinguish them from their congeners; but others, which later authors have proved to be distinct, are referred to in the notes.

Dana (in 1853) in his final classification of the Isopoda in his work on the Crustacea of the U.S. Exploring Expedition‡, enumerated five genera in the family *Idoteidæ*, but of these two are apparently insufficiently characterized. He associated the *Idoteidæ* with the *Chætiliidæ* in his subtribe *Idotaidea*, but removed the *Arcturidæ* to the Anisopoda (a group in some measure analogous to the Anomura among the stalk-eyed Crustacea), where they form, with the *Anthurincæ*, a distinct subtribe, *Anisopoda Idotaica*.

In Messrs. Spence Bate and Westwood's standard work on the British Edriophthalmia§ will be found a very complete account of the British species, accompanied by well-executed figures, and prefaced by an account of the principal anatomical and morphological characters of the *Idoteidæ*. In the system of classification adopted by these authors, the *Idoteidæ* are associated with the *Arcturidæ* among the non-parasitic water-breathing Isopoda, much as in Latreille's classification, and are far removed from the *Anthuridæ*.

One of the most important and valuable contributions to our knowledge of the subject since the publication of the 'Histoire

* In Cuvier, Règne Animal (ed. 2), iv. p. 131 (1829).

† 'Hist. naturelle des Crustacés,' iii. p. 121 (1840).

‡ Crust. in U.S. Explor. Expedition, xiv. p. 697 (1853).

§ 'A History of British Sessile-eyed Crustacea,' ii. pp. 114, 375 (1868).

naturelle des Crustacés' is Mr. Harger's memoir on the Marine Isopoda of New England and the adjacent waters*.

Here will be found not only a very full and, I believe, accurate account of the principal structural characters of the group, but also detailed descriptions, accompanied by excellent figures in outline, of all the genera and species inhabiting the eastern coast of the Northern United States, together with much new information regarding their geographical distribution, and a most useful bibliographical list of the principal works relating to the literature of the subject.

I regret that I have frequently been unable to adopt Mr. Harger's nomenclature, since a comparative study of the *Idoteidæ* from all parts of the globe has necessitated the union of several of the genera and species described by him with other previously-known types; but my obligations to his work will appear throughout the present memoir, and to it I must refer the student for further information on the structure of the buccal and sexual organs, and other points in the history of such species as inhabit the region of which it treats.

In Mr. Harger's classification the *Idoteidæ* are associated with the *Arcturidæ*.

In the present revision forty-seven species (besides several varieties) are enumerated, distributed into four genera.

Much additional value has been given to this memoir by an act of generous liberality on the part of Prof. Alph. Milne-Edwards, who, hearing that I was engaged on a revision of the *Idoteidæ*, immediately placed at my disposal for examination the rich collection of species of this group belonging to the Muséum d'Histoire naturelle of Paris, containing the types of Prof. H. Milne-Edwards's descriptions in the 'Histoire naturelle des Crustacés'; also specimens of the Algerian species described by M. Lucas, and others of which I had previously seen no specimens. Thus I have not only been able to identify the specimens in the Museum collection by actual comparison with the French types, but also to redescribe the latter with the additional detail rendered necessary by the large increase in the number of genera and species in this family.

I am also indebted to the Rev. A. M. Norman (who kindly lent me two important memoirs which otherwise I could not have

* Report of the U.S. Fish and Fisheries Commissioner for 1878 (pt. vi. 1880).

consulted), the Rev. T. R. R. Stebbing, Prof. S. Lovén, and others for assistance and information.

Whenever possible, I have taken my descriptions from typical or well-authenticated specimens of each species. In not a few cases, however, where no specimens have been available for examination, or where the material has been insufficient, the description has been taken wholly or in part from a previous author; such alterations being usually made as are necessary to ensure uniformity in the terminology employed and in the sequence of the parts described. Thus, wherever possible, the several segments of the body are *first* described, and afterwards their appendages in regular succession, whereby it is hoped the comparison of allied species will be facilitated. The difficulty of verifying the very numerous references to the synonyms has been great, and there still remain certain publications which I have been unable to consult; but these are not referred to unless the original citation was made upon good authority.

IDOTEIDÆ.

- Idotéides*, *M.-Edw. (part.)*, *Hist. Nat. Crust.* iii. p. 121 (1840).
Idotæinæ, *Dana*, *Amer. Journ. Sci. and Arts* (ser. 2) viii. p. 426 (1849).
Idotæidæ, *Dana*, *Amer. Journ. Sci. and Arts* (ser. 2) xiv. p. 300 (1852);
id. U.S. Expl. Exp. xiv. (*Crust.* ii.) p. 697 (1853).
Idoteidæ, *S. Bate and Westwood*, *Brit. Sessile-eyed Crust.* ii. p. 375
 (1868); *Miers*, *Cat. New-Zeal. Crust.* p. 91 (1876); *Harger*, *Isopoda*
in Rep. U.S. Fish Comm. (part vi.) p. 335 (1880).

The *Idoteidæ* comprised in this revision correspond to the genus *Idotea* of Milne-Edwards and to the *Idoteidæ* of Dana, Messrs. Bate and Westwood, Harger, and other authors, and may be characterized as follows:—Body ovate or oblong, or more or less oblong-ovate; head and thoracic segments distinct; postabdomen with some or all of its segments consolidated into a large terminal scutiform piece. Eyes usually lateral, but sometimes placed on the dorsal surface of the head. Antennules four-jointed and usually shorter than the antennæ, which have a five-jointed peduncle and terminate in a flagellum, which may be short, rudimentary, or composed of a single joint, or (more usually) multi-articulated. Mandibles non-palpigerous; maxillipedes operculiform. Legs usually subsimilar in form, the three anterior pairs directed forward; but in *Glyptonotus* the first three pairs ter-

minate in a subprehensile hand formed by the flexion of the terminal joint or dactylus upon the more or less dilated penultimate joint or propus. The first five pairs of postabdominal appendages are delicate and membranaceous, and are covered by the operculum, which is specially characteristic of this family. The operculum is composed of the greatly elongated and dilated bases and the interior rami of the posterior pair of postabdominal appendages or uropoda, which constitute a pair of longitudinally folding doors, closing over the ventral surface of the postabdomen; the exterior rami are also occasionally present as small lamellæ articulating with the basal plates of the operculum.

The *Idoteidæ* are found in all parts of the globe, but appear to be more abundant in the temperate and colder seas than in the tropics. They occur usually at moderate depths along the coast and often amid the seaweed, on either sandy, muddy, or rocky bottoms. Some species also may occur at considerable depths: thus *Glyptonotus entomon* has been taken at a depth of 60 fathoms in the Baltic (Möbius), and *Edotia nodulosa* at 190 fathoms off Halifax (Harger). *Idotea metallica* is a pelagic species found upon the surface of the ocean, or amid floating seaweed at great distances from the land, and other species are occasionally found under similar conditions. Although generally marine, certain species inhabit freshwater lakes; instances are the *G. entomon*, which occurs in the deep Scandinavian lakes Wener and Wettern (Prof. Lovén), and *Idotea lacustris*, which has been found in a freshwater lagoon in New Zealand by Mr. Thomson, and with which I identify, though with great hesitation, specimens, probably marine, from Port Henry, Magellan Strait, in the Museum collection.

The nearest affinities of the *Idoteidæ* are with the *Arcturidæ* and with the *Chatiliidæ* of Prof. Dana—a group founded for the reception of the single genus and species *Chatilia ovata*. As no description is given of the buccal organs and of the five anterior pairs of legs in *Chatilia*, it is impossible for me to express any opinion as to whether it should really be retained in a distinct family from the *Idoteidæ*. The multiarticulate character of the sixth and seventh pairs of thoracic legs is probably not a character of the importance assigned to it by Dana.

In its ovate form, four-segmented postabdomen, and elongated antennules the relationship of *Chatilia* to *Glyptonotus* is obvious; but the antennules in *Chatilia* are placed immediately above the antennæ, as in *Edotia*.

No less apparent is the relationship of the *Idoteidæ* to the *Arcturidæ*; the two families, as Harger has pointed out, resemble one another in the structure of the cephalic appendages, partially consolidated postabdominal segments, and operculiform uropoda. This affinity is most strikingly exemplified in comparing *Arcturus* with the genus *Idotea*. The *Arcturidæ* are distinguished principally by their robust and elongated antennæ, and by having the four anterior pairs of thoracic legs directed forward and fringed with long and flexible hairs. Whether they will be finally associated with the *Idotæidæ*, or whether it will prove to be practically more convenient to retain Dana's threefold division of the Edriophthalmia into *Isopoda*, *Anisopoda*, and *Amphipoda* (when the *Arcturidæ* must be regarded as *Anisopoda Idotæica*), remains to be determined by whomsoever shall undertake the classification of the whole of the genera of the Edriophthalmia*.

The following are diagnostic characters of the subfamilies and genera as limited in the present revision:—

Subfam. I. GLYPTONOTINÆ.

Sides of the head emarginate or cleft, and laterally produced beyond the eyes, which thus are situated upon its dorsal surface. The three anterior pairs of legs with the penultimate joint or propus dilated, and forming, with the reflexible dactylus, a prehensile hand.

Body ovate, with some or all of the epimera distinct in a dorsal view, and considerably developed. Postabdomen composed of four or five distinct segments. Antennal flagellum distinct.

GLYPTONOTUS.

Subfam. II. IDOTEINÆ.

Sides of the head not laterally produced, entire. Eyes lateral. Legs all ambulatory; the three anterior pairs with the penultimate joint not dilated.

Body oblong-ovate, with the epimera distinct and more or less evident in a dorsal view. Postabdomen composed of one to five distinct segments. Antennæ with a multiarticulated flagellum.

IDOTEA.

* Prof. Claus, in the French translation by Prof. Moquin-Tandon of his 'Grundzüge der Zoologie,' p. 465 (1871), includes both *Chatilia* and *Arcturus* in his *Idotéides*.

Body ovate, with the epimera not distinctly separated by a suture from the thoracic segments. Postabdomen nearly always uniarticulate. Antennæ with the flagellum rudimentary, few-jointed, or multiarticulated. Basal opercular plates with an oblique line crossing their outer surface. EDOTIA.

Body slender and more or less oblong-ovate, with the epimera small but distinct, and some or all evident in a dorsal view. Postabdomen composed of one to five distinct segments. Antennæ with the joints of the flagellum consolidated into a single piece. CLEANTIS.

These four genera appear to me to indicate the natural groups into which the family may be subdivided; but it must be noted that (as in all classifications) species in some degree intermediate occur. Thus in *Idotea prismatica* the flagellar segments of the antennæ are occasionally partially consolidated, and this species in many other of its characters approaches very nearly to *Cleantis*; and in *Idotea hectica* the epimera are not distinct, yet in its three-jointed postabdomen and in all other characters this species belongs to *Idotea* rather than to *Edotia*.

The principal characters for distinguishing the species of this group are to be found in the form and the degree of convexity and tuberculation of the segments of the body, the relative length of the antennæ and of their constituent joints, and similar structural details; the coloration, although occasionally characteristic, is not apparently generally to be relied upon as of great importance in the classification †.

LIST OF THE GENERA AND SPECIES.

IDOTEIDÆ.

Subfam. GLYPTONOTINÆ.

GLYPTONOTUS.

- *1. *G. antarcticus*, Eights. New South Shetlands.
2. *G. entomon* (Linn.). Baltic and circumpolar seas.
3. *G. Sabini* (Kröyer). Boreal and circumpolar seas.
4. *G. cæcus* (Say). East coast of U. States; Nova Scotia.
- *5. *G. Tuftsii* (Stimpson). East coast of U. States; Nova Scotia.

† For some very interesting remarks on the influence of the light in effecting change of colour in the *Idoteidæ* (confirmatory of previous observations by Pouchet and Jourdain on other Crustacea), see Dr. Paul Mayer, in *Mittheil. Zool. Stat. Naples*, i. p. 521 (1879).

Subfam. IDOTEINÆ.

IDOTEA.

1. *I. prismatica* (Risso). Mediterranean; shores of the English Channel.
- *2. *I. mediterranea* (Risso). Mediterranean.
3. *I. Whymperei*, Miers. North Atlantic.
- *4. *I. Danai*?, Miers. Rio de Janeiro, Brazil.
5. *I. marina* (Linn.). Mediterranean, Black and Caspian Seas, German Ocean, coasts of Great Britain, Scandinavia; E. coast of U. States, Brazil, New Zealand, Australia, Red Sea, Java?
- 5a. *I. marina*, var. *phosphorea*, Harger. E. coast of U. States; Scandinavia?
6. *I. ochotensis*, Brandt. N.E. coast of Asia; W. coast of America to California.
- *7. *I. urotoma*, Stimpson. California.
- *8. *I. gracillima* (Dana). California.
9. *I. metallica*, Bosc. Almost cosmopolitan; pelagic.
- *10. *I. margaritacea*, Dana. N. S. Wales, Port Jackson.
- *11. *I. pustulata* (Risso). Mediterranean.
12. *I. lacustris*, Thomson. New Zealand; Magellan Straits?
13. *I. Wosnesenskii*, Brandt. Sea of Ochotsk and Kamtchatka, along W. coast of N. America to California.
14. *I. Whitei*, Stimpson. California.
15. *I. emarginata* (Fabr.). Mediterranean, Britain, Denmark, and S. Scandinavia.
16. *I. resecata*, Stimpson. California.
17. *I. hectica* (Pallas). Mediterranean, Atlantic; Bourbon?
18. *I. linearis* (Linn.). Mediterranean, Britain, Denmark, Scandinavia, Canaries?, Java?
19. *I. indica*, M.-Edwards. Malabar.
20. *I. ungulata* (Pallas). Austral circumpolar or Antarctic region, Indian Ocean; C. of Good Hope; coasts of S. America northward to Rio de Janeiro and Talcahuano.
21. *I. elongata*, White (*ined.*), Miers. Auckland and Falkland Islands.
22. *I. Peronii*, M.-Edw. Coasts of Australia, Tasmania, C. of Good Hope.
23. *I. lobata*, White (*ined.*), Miers. — ?
24. *I. carinata*, Lucas. Mediterranean, Algeria.
25. *I. acuminata* (Leach). Mediterranean, Adriatic and Black Seas; coasts of Britain.
- 25a. *I. acuminata*, var. *lanciformis*, Risso. Mediterranean.
- 25b. — — — — —, var. *appendiculata* (Risso). Mediterranean.
- 25c. — — — — —, var. *lancifer*, Leach (*ined.*). S. Britain.
26. *I. stricta*, Dana. Australia, N. S. Wales.
27. *I. longicaudata* (S. Bate). S. Australia, G. of St. Vincent.
- *28. *I. Lichtensteini*, Krauss. C. of Good Hope.

EDOTIA.

1. *Edotia bicuspidata* (Owen). Boreal circumpolar region; E. coast of N. America southward to G. St. Lawrence.
2. *E. nodulosa* (Kröyer). Boreal circumpolar region; coasts of N. America southward to Brit. Columbia and Newfoundland.
3. *E. hirtipes* (M.-Edw.). S. Africa.
- 3a. — — — — —, var. *lævidorsalis*, Miers. Japan, Jatiyama Bay.
4. *E. triloba* (Say). E. coast of U. States.

- *5. *E. montosa* (Stimpson). E. coast of N. America.
 5a. ———, var. *hirsuta* (Harger). Whitney River.
 6. *E. tuberculata*, Guérin-Ménéville. Sts. of Magellan and Falklands.
 7. *E. magellanica*, Cunningham. Sts. of Magellan.
 *8. *E. ? chilensis* (Gay). Chile.

CLEANTIS.

- *1. *C. (Erichsonia) angulata* (Dana). Rio de Janeiro.
 2. *C. (E.) filiformis* (Say). New Jersey, Massachusetts; Gloria
 (Brazil?).
 *3. *C. (E.) attenuata* (Harger). New Jersey, Connecticut.
 4. *C. (Cleantis) isopus*, Grube (*ined.*). Cheefoo, Ojica, Goto Island.
 *5. *C. (C.) linearis*, Dana. N. Patagonia, Rio Negro.
 *6. *C. (C.) granulosa*, Heller. St. Paul.

The species marked with an asterisk are those of which I have seen no specimens, and several of these are very probably insufficiently characterized (for further information on this head see under the several species). The following may be mentioned, however, as very doubtfully distinct:—*Idotea margaritacea*, *I. pustulata*, *I. stricta*, *Edotia montosa*. Large though the number be of supposed species now reduced to the rank of synonyma, it is probable that future workers will add others to the list.

Subfamily I. GLYPTONOTINÆ.

Sides of the head emarginate or cleft, and laterally produced beyond the eyes, which thus are situated upon its dorsal surface. The three anterior pairs of legs with the penultimate joint or propus dilated and forming, with the reflexible dactylus, a prehensile hand.

Species more or less ovate.

This subfamily includes the single genus

GLYPTONOTUS.

Glyptonotus, *Eights*, "Trans. Albany Instit. ii. p. 331, pls. (1833-52);"
id. Amer. Journ. of Sci. & Arts (ser. 2) xv. p. 135 (1853); *id. Ann.*
& Mag. Nat. Hist. xi. p. 339 (1853); *id. Amer. Journ. of Sci. & Arts*,
 xxii. p. 391, pls. ii., iii. (1856).

Idotæga, Lockington, *Pr. Cal. Acad. Sci.* (pt. i.) vii. p. 44 (1877).

Chiridotea, Harger, *Amer. Journ. of Sci. & Arts*, xv. p. 374 (1878);
Marine Isopoda of New England in Rep. U.S. Comm. of Fish and
Fisheries (pt. vi.), p. 337 (1880).

? *Saussureana*, Haller, "Mitth. schweiz. ent. Ges. v. p. 573 (1879)."

Body moderately convex and more or less ovate, broadest at the third or fourth thoracic segments, with the sides thence con-

vergent to the subacute distal extremity of the postabdomen. Head enlarged; its lateral margins divided by a suture into two lobes, behind which the eyes are situated. Postabdomen large, consisting of four or five distinct segments. Antennules somewhat elongated. Antennæ rather short, but with a well-developed articulated flagellum. Mandibles robust. Maxillipedes with a 3-5-jointed palpus. Epimera considerably developed, and some or all evident in a dorsal view, the posterior three pairs prolonged backward at their acute postero-lateral angles. Legs robust; those of the three anterior pairs thrown forward, with the dactylus reflexible and the penultimate joints or palms dilated, the dilatation usually greatest in the first pair. Operculum with the basal plates marked with a raised line running close to and nearly parallel with the inner margins, but without an oblique line on their outer surface; beneath the terminal plates is a very small oval lamella, which is the outer ramus of the modified uropoda.

Mr. Harger, in his description of *Chiridotæa*, first indicated the natural limits of this genus, and that it would include the long-known *Idotea entomon* and *I. Sabini* (Am. J. Sci. & Arts, xv. p. 374, 1878). By many, and even some recent, authorities these species, notwithstanding their obvious distinctness from other members of the family, have been included in the genus *Idotea*.

I have not been able to consult Haller's description of *Saussureana*, and the citation of this genus as synonymous with *Glyptonotus* must be considered doubtful. According to the generic diagnosis quoted by Dr. Bertkau (Archiv f. Naturgesch. xlv. p. 271, 1880), the three anterior thoracic legs are chelate, body linear (an approach to this form is exhibited in young *G. Sabini*). The species, which its author does not name, only differs from *Glyptonotus* in its very short antennæ, and is from Labrador.

In its geographical range *Glyptonotus* appears to be confined to the colder temperate, arctic, and antarctic seas.

The species of this genus may be distinguished as follows:—

a. *Epimera distinct only on the three posterior segments.*

Thoracic segments with a median line of tubercles; terminal postabdominal segment longitudinally carinated.

1. *G. antarcticus*, Eights.

b. *Epimera* on the second to seventh segments distinct.

* *Species large, elongate-ovate; outer ramus of uropoda (or opercular valves) minute.*

Joints of the peduncle of the antennæ not dilated; flagellum 8-14-jointed; antero-lateral cervical lobes prominent.

2. *G. entomon* (Linn.).

Joints and peduncle of antennæ greatly dilated; flagellum 7-8-jointed; antero-lateral cervical lobes not prominent.

3. *G. Sabini* (Kröyer)?

** *Species small, orbiculate-ovate; outer ramus of uropoda at least half as long as the inner.*

Antennæ little longer than the antennules; flagellum about 7-jointed; eyes inconspicuous.

4. *G. cæcus* (Say).

Antennæ about twice as long as the antennules; flagellum about 12-jointed. Eyes usually distinct.

5. *G. Tuftsii* (Stimpson).

GLYPTONOTUS ANTARCTICUS.

Glyptonotus antarcticus, Eights, "Trans. Albany Instit. ii. p. 331, pls. (1833-52)"; *Amer. Journ. of Sci. & Arts* (ser. 2) xv. p. 135 (1853), xxii. p. 391, pls. ii., iii. (1856); *Ann. & Mag. Nat. Hist.* xi. p. 339 (1853).

The head (according to Dr. Eights, from whose long description and figures the following is adapted) is transversely elliptical, its superior surface is ornamented with an imperfectly sculptured "fleur-de-lis," its posterior portion obtusely elevated, producing a marginal rim; in the middle of the anterior margin there is a small notch. The segments of the thorax are beautifully sculptured on their upper surface, and, together with the post-abdominal segments, are each armed with a median, angular, and elongated knob, which, when united, form a prominent dorsal ridge, gradually diminishing in its backward course, and forming a sharp elevated line along the terminal segment, terminating at its extremity in a short and obtusely-pointed spine. The thoracic segments are bordered along their posterior margins by an elevated and continuous marginal rim, extending to the lateral extremities of the shell. The postabdomen is composed of five segments; the four anterior are much smaller than those of the thorax, but greatly resemble them in form, being ornamented on their superior surfaces with similar insculptations, though but slightly defined; the fourth segment (as shown in the figure) is much broader than the base of the terminal segment, and its

postero-lateral angles are greatly prolonged and acute; the terminal segment is large and triangular, and, as appears from the figure, is obtusely pointed at its distal extremity. Eyes small, reniform, indigo-blue, placed near the lateral and anterior margin of the head. Antennules half the length of the antennæ, three-jointed, and terminating in an attenuated filament (flagellum), whose articulations are indistinct. Antennæ corresponding in length to the width of the head, transversely from spine to spine (exclusive of flagellum?); peduncular joints four in number, the last the longest; flagellum about the length of the peduncle, multiarticulated (joints over twenty in the figure). The epimera are distinguishable in a dorsal view on the three posterior thoracic segments only (in the figure they are large, with acute postero-lateral angles). The three anterior legs project forward, the dactyli being incurved upon the edges of the rather largely-inflated penultimate joints; the four posterior legs are directed backward, and are strongly triangulate, stout, and ponderous, terminating with a slightly curved nail; their length is nearly equal, but they gradually increase in thickness as they recede towards the tail. The basal joints are large and inflated, the remainder regularly angulate; the extremities of the articulating joints and edges of the two inferior angles are each provided with a series of tufted and rigid spines. The biarticulated opercular valves are of a triangulate form, each having near its termination a small oval articulation. Colour brown-sepia. Length from the insertion of the antennæ $3\frac{1}{2}$ inches (nearly 90 millim.); width $1\frac{3}{4}$ inch (nearly 45 millim.).

This gigantic species inhabits the shores of the New South Shetlands. According to Dr. Eights, it inhabits the bottom of the sea, and is only to be obtained when thrown far upon the shores by the immense surges that prevail when the detached glaciers from the land precipitate themselves into the ocean. I have seen no specimens.

Although distinguished from the arctic species by the non-distinctness of the three anterior epimera, the longitudinal median line of dorsal tubercles, and other characters, it cannot, I think, be regarded as generically distinct.

GLYPTONOTUS ENTOMON. (Plate I. figs. 1 & 2.)

Oniscus entomon, *Linn. Syst. Nat.* (ed. xii.) ii. p. 1060 (1766); *Pallas, Spicil. Zool.* ix. (fasc. 9) p. 64, pl. v. figs. 1-6 (1772).

"? *Entomon pyramidale*, *Klein, Rem. sur les Crustacés*, figs. 1-3."

Squilla entomon, *De Geer, Mém. pour servir à l'Hist. des Insectes*, vii. p. 514, pl. xxxii. figs. 1-10 (1778).

Asellus entomon, *Olivier, Encycl. Méth.* p. 253 (1789).

? *Cymothoa entomon*, *Fabr. Ent. Syst.* ii. p. 505 (1793).

? *Asellus entomon*, *Olivier, Encycl. Méth.* iv. p. 253 (1789).

Idotea entomon, *Bosc, Hist. Nat. des Crust.* ii. p. 178 (1802); ? *Latr. Hist. Nat. Crust. et Ins.* vi. p. 361, vii. pl. lviii. figs. 2, 3 (1803-4); ? *Lamarck, Hist. des Anim. sans Vert.* (ed. i.) v. p. 159 (1818); ? *Sabine, Appendix in Parry's Arctic Voy.* p. cccxxviii (1821); ? *Ross, Zool. in Parry's 3rd Voy.* p. 117 (1826); ? *Desm. Consid. Cr.* p. 289 (1825); ? *Eichwald, "Geogn. zool. per Ingriam marisque Baltici provincias obs.* pl. v. fig. 1"; *Rathke, "Neuste Schriften der naturf. Gesellsch. in Danzig*, i. p. 109, pl. iv. (1820)"; *Kröyer, Vid. Selsk. Skrift.* vii. p. 323 (1838); *M.-Edwards, Hist. Nat. Crust.* iii. p. 128 (1840)?; *Kröyer, Nat. Tidsskr.* ii. p. 402 (1847); *White, List Cr. Brit. Mus.* p. 93 (1847); *Brandt, Cr. in Middendorff's Sibirische Reise*, ii. p. 145 (1851); *Lovén, Æfvers. Vetensk.-Akad. Förhandl. Stockholm*, xviii. p. 286 (1852); *Bell, in Belcher's Last of the Arctic Voyages*, i. p. 408 (1855)?; *Lindström, Æfv. Vet.-Akad. Förhandl.* p. 66 (1856); *Haughton, Proc. Nat. Hist. Soc. Dublin*, iv. p. 61 (1865); *Möbius, Ann. & Mag. Nat. Hist.* ser. 4, xii. p. 84 (1873); *Cajander, Cr. in Notiser Fauna & Flora Fennica*, p. 374 (1869); *Meinert, Nat. Tidsskr.* (3 R.) xi. p. 84 (1877); *Brandt, Comptes Rendus*, p. 713 (1880); *id. Ann. & Mag. Nat. Hist.* vi. p. 98 (1880).

? *Saduria entomon*, *Adams, in White, Sutherland's Voy. Baffin's Bay, &c. Appendix*, p. ccvii (1852).

Idotæga longicauda, *Lockington, Pr. Cal. Acad. Sci.* vii. (pt. i.) p. 45 (1877).

In the specimens I refer to this species the body is ovate, moderately convex, with a more or less faintly-indicated median carina, and posteriorly much elongated. Head anteriorly deeply excavated, its anterior margin with a median sinus, its antero-lateral lobes rounded or subtruncated, its anterior margin slightly thickened on each side of the median sinus. The three anterior segments have each a slight elevation in the middle line, and another on each side, but at some distance from the lateral margins (these are most distinct in the younger individuals); the first segment is widest at the lateral margins. The post-abdomen is longer than the thorax, with the first four segments distinct but very short; terminal segment smooth, with the sides convergent to the distal extremity, which usually curves upward and is blunt or subacute; the median longitudinal dorsal carina is more distinctly indicated on this segment than on the rest of the

body. Eyes small, often indistinct or obsolete. Antennules about reaching to the end of the antennal peduncle, with the basal joint thickened and the rest slender and elongated. Antennæ with the penultimate joint of the peduncle rather small and not dilated; last joint longer than the preceding, flattened above, but not dilated as in *Idotea Sabini*; flagellum about 8-14-jointed. Epimera of all the segments broad, with the postero-lateral angles acute, and in the fourth to seventh segments considerably prolonged backward. Legs (in the adult) very robust; the palmar or penultimate joint of the first three pairs dilated, but narrowed at the apex, where it is articulated with the slender dactylus; the four posterior pairs considerably elongated (the posterior pair reaching, when retracted, beyond the end of the postabdomen), with the joints, except the dactylus, thickened, with more or less hairy margins. Terminal valves of the operculum very small and narrow; in an adult example scarcely one fifth the length of the preceding. Length of the largest specimen in the Museum about 3 inches (77 millim.), breadth rather more than $1\frac{1}{3}$ inch (35 millim.).

This species occurs in the Baltic, and not improbably throughout the Arctic and circumpolar seas; also in the depths of the Swedish lakes (Prof. Lovén).

Specimens are in the collection of the British Museum from the following localities:—An adult and four young examples from the "Northern Seas" (*Old Collection*, preserved dry); an adult and younger example (dry) from the Cattegat (the Rev. Prof. Haughton); two examples (dry) from the Baltic (Prof. Lovén); two small examples in imperfect condition from the Banksian Collection, one of which bears the designation *Saduria entomon* in, I believe, Dr. Leach's handwriting. A fine adult example, sent by Mr. Lockington, under the name of "*Idotæga alaskensis*," and labelled as coming from Behring's Straits, cannot be distinguished specifically from the foregoing. It is probably a male, but the second pair of postabdominal appendages are without stylets.

In the collection entrusted to me for examination by Prof. Alph. Milne-Edwards, and containing the types of the Paris Museum, is a male of rather small size from Sweden (Dr. Malm), and labelled as inhabiting "*les eaux douces*."

In none of the specimens I have examined is an incubatory pouch developed.

Idotea entomon occurs, according to Grimm, Zeitsch. f. wiss. Zool. xxv. p. 324 (1875), in great abundance in the Caspian Sea; but it does not appear, from this author's note, whether this is the species here described as *G. entomon*.

There is a specimen, labelled *entomon*, of this species in the Linnean Cabinet in the possession of the Linnean Society; hence there can be little doubt that this is the true *entomon* of Linnæus. It is certainly the species so designated by Pallas, since he figures the last two joints of the peduncle of the antennæ of the elongated, less dilated form characteristic of our Baltic examples.

The *Idoteë vitée*, Bosc (Hist. Nat. Crust. ii. p. 180, 1802) (*Idotea vittata*, Latr.) has the body composed of ten segments, of a grey colour punctated with brown, with a broad yellow band on the back; tail elongated and pointed. It is allied, according to Latreille, to *Idotea entomon*, but is scarcely $3\frac{1}{2}$ lines in length, and the segments are without lateral appendages (epimera?). On account of the last-mentioned character, I doubt if it should be referred to this genus. It was found in the open sea.

GLYPTONOTUS SABINI. (Plate I. figs. 3-5.)

? *Idotea Sabini*, Krøyer, *Nat. Tidsskr.* (2 R.) ii. p. 401 (1847); *Atlas of Crust. in Gaimard's Voy. en Scand.* pl. xxvii. fig. 1; Reinhardt, *Fortegnelse over Grönlands Krebsdyr*, p. 34 (1857); Lütken, *List of Crust. of Greenland in Arctic Manual*, p. 149 (1875); Sars, *Arch. f. Math. og Naturvidensk.* ii. p. 350 (1877); var., Heller, *Denkschr. der Akad. Wien*, xxxv. p. 38 (1878).

? *Chiridothea megalura*, G. O. Sars, *Archiv f. Math. og Naturvidenskab.* iv. p. 432 (1880).

In this species the body is narrower and more elongated than in *G. entomon*, and the postero-lateral angles of the first segment and of the epimera of the second segment are not so much prolonged backward and are less acute. The terminal postabdominal segment appears to be firmly ankylosed with the fourth, and is sinuated on the sides at the base, and again at a point rather more than halfway to the apex, which is slightly recurved. The penultimate and terminal joints of the peduncle of the antennæ are flattened above and considerably dilated, with the margins cristiform and acute; the flagellum 7-8-jointed. The largest specimen I have seen is about $3\frac{1}{8}$ inches long (80 millim.), and rather more than $1\frac{1}{12}$ inch broad (29 millim.).

I doubt whether the characters assigned to the *Chiridothea*

megalura of Sars can be regarded as of specific importance. In most of the specimens I refer to *G. Sabini* the greatest width of the terminal postabdominal segment slightly exceeds half its length.

The materials at my disposal are insufficient to determine the geographical range of this species, which, like the preceding, appears to be confined to high Northern and Arctic latitudes. There are in the collection of the British Museum an adult male from Davis Straits (Dr. Sutherland), in which, as the specimen is preserved in spirits, I have been able to ascertain that the styliform appendages of the second pair of postabdominal appendages are fully developed; a smaller male from the Haslar Hospital Collection, also with fully-developed stylets; two adult males from Repulse Bay, N. America (Dr. Rae, preserved dry); also an adult female with fully-developed incubatory pouch, from Riscoe (Disco?), Davis Straits, collected in lat. 67° 10' N.

A specimen whose particular locality is unfortunately unknown, but which was contained in a jar with other species supposed to come from some point on the W. coast of N. America, also probably belongs to this species; but the epimera of the second to fourth segments are not so deep in proportion to their length as in the other examples.

A young example obtained near Picton Rock Glacier (Dr. Sutherland) resembles the adult in the general outline of the body; the epimera of the three posterior thoracic segments, however, are somewhat slenderer and more elongated. There is an open notch at the sides of the head. The joints of the peduncle of the antennæ are dilated, as in the adult; those of the flagellum are not distinguishable. Length $\frac{7}{12}$ inch (15 millim.); greatest breadth about 5 millim. Its slenderer and more elongated form, and the dilatation of the peduncular joints of the antennæ, thus clearly distinguish this species, even in its young condition, from *G. cæcus*. (See Plate I. fig. 2b.)

Glyptonotus Sabini occurs in a subfossil state in Greenland, according to Prof. S. Lovén (see Nordenskiöld in Arctic Manual, p. 410, 1875).

It is not improbable that many of the earlier writers may have confounded this species and *G. entomon*, or referred to *G. Sabini* under the Linnean name.

I refer the Museum specimens with some doubt to Krøyer's species, because in his diagnosis he makes no mention of that

which is certainly their most marked distinctive character, *i. e.* the considerable dilatation of the peduncular joints of the antennæ, nor does his figure represent these joints as much dilated as in the specimens before me; moreover, the characters of the antennular joints and of the anterior thoracic legs do not entirely correspond; but these points are probably of minor importance. His species corresponds with ours in its more elongated form, shorter antennal flagellum, and, as the figure shows, in the less prominent antero-lateral lobe of the head. Should, however, the specimens in the Museum collection prove to be distinct, they may probably be designated by Sars's specific name *megalura*. Heller, it may be added, in his remarks upon this species, in his account of the Crustacea collected by the Austrian Expedition to the North Pole, adheres to Kröyer's diagnosis.

GLYPTONOTUS CÆCUS.

Idotea cæca, Say, *Journ. Ac. Nat. Sci. Phil.* i. p. 424 (1818); Hitchcock, *Rep. Geol. Mass.* p. 29 (1833); Gould, *Invert. of Massachusetts*, p. 337 (1841); M.-Edw. *Hist. Nat. Crust.* iii. p. 131 (1840); DeKay, *Zool. New York Fauna*, vi., Cr. p. 42 (1844); White, *List Cr. Brit. Mus.* p. 94 (1847); Verrill, *Rep. U.S. Commiss. of Fish & Fisheries*, i. p. 340 (1874); Harger, *Rep. U.S. Commiss. of Fish & Fisheries*, i. p. 569, pl. v. fig. 22 (1874).

Chiridotea cæca, Harger, *Am. Journ. Sci. & Arts*, (ser. 3) xv. p. 374 (1878); *id. Pr. U.S. Nat. Mus.* ii. p. 159 (1879); *id. Rep. U.S. Commiss. of Fish & Fisheries*, vi. p. 338, pl. iv. figs. 16-19 (1880).

The body is very broadly ovate, narrowing rapidly posteriorly. Head but slightly excavated in front for the bases of the antennæ, and with a more or less open notch at the sides extending nearly to the eyes; the breadth of the thorax is greater than its length, and the length of the segments is greater on the sides than in the median line; the postabdomen is convex above, with the first three segments very short, the fourth indicated only by lateral sutures, and united in the dorsal region with the terminal segment, which is ovate-lanceolate, scarcely sinuated on the sides, and acute at the distal end; the eyes are light-coloured and inconspicuous. Antennules longer than the peduncle of the antennæ. Antennæ with the peduncular joints of moderate length, not much dilated; flagellum about 7-jointed. Epimera with the postero-lateral angles acute, but not greatly prolonged backward. The three anterior pairs of legs have the propus or penultimate joint dilated, the dilatation being greatest in the first pair, and the

dactylus completely reflexible. The four posterior legs are similar in form, with non-dilated penultimate joints, and clothed with bristly hairs. The stylet on the second pair of postabdominal appendages is elongated and curved at the tip. The terminal plates of the opercular valves are small and not acute at the apices. The colour of this species is variable, but usually dark greyish, with lateral mottlings of light yellowish grey. Its length does not exceed $\frac{2}{3}$ inch (12–16 mm.), and breadth $\frac{1}{3}$ inch (6–8 mm.).

The description is almost entirely taken from Mr. Harger's valuable report.

Its range extends along the eastern shores of North America as far south, according to Say, as Florida, and northward to Nova Scotia, it having been obtained at Halifax in 1877 by the naturalists of the U.S. Fish Commission. There are in the British-Museum collection five small, and now imperfect, examples of this species, presented by Thomas Say.

GLYPTONOTUS TUFTSII.

Idotea Tuftsii, Stimpson, *Marine Invert. Great Manan*, p. 39 (1853); *Verrill, Pr. Amer. Assoc.* p. 362 (1874); *id. Rep. U.S. Commiss. of Fish & Fisheries*, i. p. 340 (1874); *Harger, Rep. U.S. Commiss. of Fish & Fisheries*, i. p. 569 (1874).

Chiridotea Tuftsii, Harger, *Am. Journ. of Sci. & Arts*, (ser. 3) xv. p. 374 (1878); *id. Proc. U.S. Nat. Mus.* ii. p. 159 (1879); *id. Rep. U.S. Commiss. of Fish & Fisheries*, vi. p. 340, pls. iv. & v. figs. 20–23 (1880).

This species, of which I have seen no specimens, is, according to Mr. Harger, distinguished from the preceding by its smaller size and longer antennæ, the joints of the peduncle of which are slenderer than in *G. cæcus*, the fifth as long as the third and fourth together; the flagellum about 12-jointed, longer than the peduncle, and tapering from the base. The antennules are slender, and do not surpass the peduncle of the antennæ. The incision in the produced lateral margin of the head is nearly closed by the overlapping of the antero-lateral lobe.

The length scarcely exceeds $\frac{1}{3}$ inch (9 mm.), breadth $\frac{1}{8}$ inch (4–5 mm.).

It has been taken at various localities on the eastern coast of Nova Scotia and the United States, *e.g.* at Halifax, in the Bay of Fundy, on the coast of Maine and Massachusetts (in considerable abundance), and in Long Island Sound. For further particulars see Harger's often-cited Report on the Marine Isopoda of

New England &c., in the sixth part of the Report of the U.S. Fish Commission (1880).

The *Æga Harfordi* of Lockington (Pr. Cal. Acad. Sci. p. 46, 1877) is designated *Idotea Harfordi* in a MS. note of the author, and the short description would apply in most particulars to a species of *Glyptonotus*. Specimens, however, are in the British Museum from Sta. Rosa Island, received from Mr. Lockington, which certainly do not belong to any genus of *Idoteidæ*, but to *Cirolana* or a closely allied type. Can it be that two distinct species were confounded under one name?

Subfamily II. IDOTEINÆ.

Sides of the head in a dorsal view entire and not laterally produced. Eyes lateral. Legs all ambulatory; the three anterior pairs with the penultimate joint not dilated.

The species are ovate or (more usually) more or less oblong-ovate, or slender and linear, and none attain so bulky a size as do certain of the species of *Glyptonotus*.

IDOTEÆ.

Idotea, *Fabr. (part.) Ent. Syst. Suppl.* p. 302 (1798); *Latr. (part.) Hist. Nat. Crust. et Ins.* vi. p. 560 (1803); *Lamarck, Hist. des Anim. sans Vert.* v. p. 160 (1818); *Leach (part.), Trans. Linn. Soc.* xi. pp. 353, 364 (1815); *Desm. Consid. Crust.* p. 288 (1825); *M.-Edw. (part.) Hist. Nat. Crust.* iii. p. 125 (1840); *Dana (part.), Amer. Journ. of Sci. & Arts, (ser. 2) xiv.* p. 300 (1852); *id. U.S. Expl. Exp. xiv., Cr. ii.* p. 697 (1853); *Bate & Westwood (part.), Hist. Brit. Sessile-eyed Crust.* ii. p. 376 (1868); *Harger, Marine Isopoda, in Rep. U.S. Fish Commission, pt. vi.* p. 341 (1880).

Stenosoma, *Leach, Trans. Linn. Soc.* xi. pp. 353, 366 (1815); *Desm. Consid. Crust.* p. 290 (1825).

Leptosoma (*Leach, MS.*), *Risso, Hist. Nat. Eur. mérid.* v. p. 107 (1826).

Zenobia, *Risso, t. c.* p. 110 (1826).

Armida, *Risso, t. c.* p. 109 (1826).

Crabyzos, *S. Bate, Proc. Zool. Soc.* p. 504 (1863).

Body moderately convex, more or less elongated, and oblong-oval. Head with the sides not laterally produced and bilobated. Postabdomen consisting of one to five segments, rarely uniarticulate, but with lateral sutures indicative of one or more additional, partially coalescent, segments. Eyes placed close to the lateral margins. Antennules small. Antennæ elongated, with a well-

developed and multiarticulate flagellum. Palpi of the maxillipedes four-jointed, the last composed of two coalescent joints. Epimera well developed and evident in a dorsal view, but not greatly elongated, as in *Glyptonotus*. Legs with the dactyli more or less reflexible, but with the penultimate joint not considerably dilated as in *Glyptonotus*. Operculum with the basal plates usually marked with a raised line running close to and nearly parallel with the inner margins, but without an oblique line as in *Eidotia* *, each bearing at its distal end a strong plumose bristle, which is concealed by the terminal opercular plate.

The species of this genus are distributed throughout the world, but occur but very rarely in the highest latitudes.

Leach's designation of *Stenosoma* has been adopted by some subsequent authors for certain species of *Idotea*. The original diagnosis, however, does not permit even of its being used for a sectional designation in the present revision. *Leptosoma*, on the other hand, will include all *Idoteæ* with a uniarticulate postabdomen. *Armida* of Risso may probably include the typical *Idoteæ* with three-jointed postabdomen and indications of a fourth, partially coalescent, segment, although he says, "*abdomen quadriarticulatus*."

The genus *Hebe*, included by Risso among his Idoteadées, is obviously very inaccurately characterized; but on account of the short antennæ and subulate postabdominal appendages can hardly belong to any of the European members of this family, but may perhaps be referred to the *Anthuridæ*. In the single species (*H. punctata*) the third pair of legs are three times as long as the rest.

I. *Postabdomen composed of four or five distinct segments, visible in a dorsal view. (Species small or minute, with a few-jointed antennal flagellum.) Zenobia?*

This section is established provisionally for certain species, two of which are of minute size, and may possibly be young forms; but as I have not seen any young examples presenting similar characters, I have thought it better, for the present at least, to consider them distinct. Risso, it may be noted, makes no mention of the few-jointed antennal flagellum in *Zenobia*; but this character exists in specimens, which I have scarcely any doubt are rightly referred to his *Z. prismatica*, in the Paris collection.

* Faint traces of an oblique line are, however, observable in *I. Wosncsensskii*.

The following characters will apparently suffice to distinguish the species referred to this section:—

* *Terminal segment wider at base than the preceding segments.*

Terminal segment subtriangulate, with the angles rounded.

1. *I. Whymperi*, Miers.

** *Terminal segment not wider at base than the preceding.*

Rounded at the distal end.

2. *I. prismatica* (Risso).

Feebly emarginate at the distal end.

3. *I. mediterranea* (Risso),

Subangulated at the distal end.

4. *I. Danai*, Miers.

IDOTEA PRISMATICA.

Zenobia prismatica, Risso, *Hist. Nat. Eur. mérid.* v. p. 111, pl. v. fig. 24 (1826); Lucas, *Anim. artic. in Expl. Sci. Algérie*, p. 63 (1849); Hope, *Cat. Cr. Ital.* p. 27 (1851).

Idotea chelipes, Costa, *Faun. Reg. Napoli, Cr.* pl. xi. fig. 2 (1838); Hope, *Catal. Crust.* p. 26 (1851); *nec Fabr., nec Latr.*

Idotea prismatica, Heller, *Verh. zool.-bot. Gesellsch. Wien*, xvi. p. 729 (1866); Stalio, *Att. Istit. Venet.* (ser. 5) iii. p. 1354 (1876-77).

Idotea parallela, S. Bate & Westwood, *Brit. Sessile-eyed Crust.* ii. p. 391, fig. (1868); Stebbing, *Rep. Devon Assoc.* vi. p. 772 (1874).

The body is convex, narrow, and elongated, with the sides parallel and the dorsal surface smooth. Head with its anterior margin nearly straight, but feebly emarginate in the middle. First thoracic segment with small rounded antero-lateral lobes which do not reach to the eyes; all the thoracic segments with their anterior and posterior margins nearly straight, their postero-lateral angles rounded in the first three segments, and not at all produced in the following segments. Postabdomen with four distinct segments, the three first very short, the fourth nearly twice as long as broad, with lateral sutures indicative of a coalescent segment near its base, its distal extremity semicircularly rounded and entire, and the dorsal surface flat in its distal half and subobliquely deflexed. Eyes black, nearly linear, and transverse. Antennules short, four-jointed, the basal joint but moderately dilated. Antennæ not exceeding one third the length of the animal; peduncle five-jointed, the first joint very short, the fourth and fifth subequal; flagellum with five or six distinct joints, of which the first is very short, the second longest (apparently composed of two coalescent joints), the rest short, the last being minute and concealed by a pencil of short stiff hairs. Legs

slender, small, and of nearly equal length, the first, however, being more robust. Epimera narrow, not reaching, in the second to fourth segments, quite to the postero-lateral angles of the segments; in the fifth to seventh segments the epimera are acute and prolonged backward beyond the thoracic segments. Opercular valves with their distal plates small, rounded off at their posterior and external angles. The colour (according to M. Risso) of the body is olive-green, with a longitudinal median and two lateral blackish lines; all the segments with scattered punctulations; postabdomen of an opaque grey. Antennæ annulated with white and brown; legs yellowish. Length of the largest male I have examined about $1\frac{7}{8}$ inch (15 mm.); but many of the specimens are much smaller.

This species inhabits the shores of the Mediterranean and Adriatic, and its range extends northward to the shores of the English Channel.

The description (except as regards colour) and measurements are taken from specimens in the collection of the Paris Museum, which, I doubt not, are correctly referred to this species, and of which two have been obtained (in exchange) for the British Museum. M. Risso's description and figure would lead one to suppose that the jointed flagellum is absent; and it is evident from the description of Messrs. Bate and Westwood that the joints are sometimes imperfectly defined. Dr. Heller particularly mentions the existence of a short 3-5-jointed flagellum in specimens from Lesina. There are in the Paris collection seven specimens (males and females) from Bona (M. Lucas).

The Rev. A. M. Norman kindly sent to me for examination a specimen of *I. parallela* from Paignton, S. Devon, presented to him by the Rev. T. R. R. Stebbing, which places the correctness of the identification of the British species with the Mediterranean *I. prismatica* beyond a doubt. In it, however, the articulations of the flagella of the antennæ are scarcely distinguishable; and, as I have already noted, Bate and Westwood in their description mention the partial consolidation of these joints. In most, if not all, of the specimens from the Mediterranean the joints of the flagellum are perfectly distinct.

IDOTEA ? MEDITERRANEA.

Zenobia mediterranea, Risso, *Hist. Nat. Eur. mérid.* v. p. 111 (1826);
Hope, Cat. Cr. Ital. p. 27 (1851).

Differs from the preceding, according to M. Risso, only by its

smoother, more shining body, which is of an olive-green colour, with fine longitudinal olive-brown lines, and which is covered with more widely scattered punctulations; the antennæ and legs are of a clear grey, and the terminal postabdominal segment is feebly emarginated. Length nearly $\frac{1}{2}$ inch (12 mm.), breadth about $\frac{1}{12}$ inch (2 mm.). Among algæ.

Having seen no specimens of this species, I cannot say whether it is in reality distinct from the foregoing.

IDOTEA WHYMPERI, sp. n. ? (Plate I. figs. 6 & 7.)

Idotea, sp. ?, *Miers, Journ. Linn. Soc.* xv. p. 64 (1880).

The body is of narrow-oblong form, the head comparatively large, with a very slightly prominent broad and rounded median lobe. The sides of the body are parallel, the segments being of equal width, the three or four posterior having their posterolateral angles (formed apparently by the laterally projecting epimera) acute. There are four distinct postabdominal segments; the first three very short; the last is triangular in form, with the angles rounded, broadest at base, where it considerably exceeds in width the preceding segments, and with the sides convergent to the distal extremity, which is broad and obtusely rounded. The eyes (black) are placed in the middle of the lateral margins of the head. The antennules are apparently four-jointed; the antennæ have six joints exposed, the four first thickened, and the last two slenderer and more elongated; the last ends in a pencil of fine hairs. The legs are imperfect, but are armed with a subterminal as well as a terminal claw. The plates of the operculum are not oblong, but rather oval in shape, narrowing to the distal end. Length scarcely $1\frac{1}{2}$ line (3 mm.).

North mid-Atlantic Ocean, lat. $57^{\circ} 59' N.$, long. $19^{\circ} 1' W.$ The single example was obtained by washing seaweed taken on the surface, and is mounted for the microscope.

The joints both of the antennæ and postabdomen and the epimeral sutures are with difficulty discernible, and perhaps the examination of a larger series of examples would necessitate an emendation of some points in the description; nevertheless, as this example appears to be very distinct from any species with which I am acquainted, I designate it by the name proposed for it at the time of its original description.

IDOTEA DANAI, sp. n. ?

Idotea brevicauda, yg., *Dana*, *U.S. Expl. Exp.* xiv. (Cr. ii.) p. 703, pl. xlvi. fig. 5 (1853).

In this form the body is broadest anteriorly. Head transverse, subtruncate in front, and not embraced by the following segment, with the centre slightly projecting and the sides rounded. The thoracic segments increase in length from the first to the last, the anterior very short, or only partly visible, the three posterior sublunate in an upper view, the posterior margins being concave and the angles prolonged, but obtuse or nearly so. Postabdomen 5-jointed, the first four joints transverse and subequal, the first abruptly narrower than the following or preceding thoracic segment, the fifth oblong, shield-shaped, the sides curving and meeting behind in an angle. Eyes rather large. Antennules less than half the length of the antennæ, the third joint smaller than the second. Antennæ only 7-jointed; the first five joints correspond to the peduncle, the first three are quite short, the second has the outer apex prolonged the length of the third joint, the fourth and fifth are a little oblong, but shorter than the sixth and seventh, the last is acute; a few short hairs on the joints. Legs subequal, increasing from the first pair to the last; the claw is nearly straight, and has a largish subconical base. The posterior plates of the operculum are triangulate, with the distal angle acute (see Dana's figure). Colour brownish grey. Length 1 line.

Loc. Rio Janeiro (harbour).

It appears to be very closely allied to the foregoing, and too distinct from *I. marina* (with which I consider *I. brevicauda* to be synonymous) to be regarded as the young of that species. It is distinguished from *I. Whymperi* by the form of the terminal postabdominal segment, which is no broader than the preceding at its base, and by the more acute terminal plate of the opercular valves. In the outline figure no epimeral sutures are visible.

II. *Postabdomen composed of three distinct segments (visible in a dorsal view); and with one or more sutures on the side, indicative of partially coalescent segments.* (Armida, Risso ?)

This section includes *Idotea marina* (Linn.), which may be considered the type of the genus in its restricted sense.

a. *Terminal segment dentated or subtruncated or rounded at its distal end.*

As the form of the epimera is not known in all of the species of this subsection, I have not been able to make use of this character in the following analysis of the species to as large an extent as its importance deserves.

* *Terminal segment distinctly toothed or acute at its distal end.*

Oblong-ovate: terminal segment tricuspidate, or more or less acute at its distal end. 1. *I. marina* (Linn.).

Oblong-ovate: terminal segment with a blunt median tooth at its distal end. 2. *I. Whitei*, Stimpson.

Oblong, with subparallel sides: terminal segment more or less triangulate. 3. *I. ochotensis*, Brandt.

Slender-linear: terminal segment with the prominent postero-lateral angles separated by a tooth from the blunt median portion.

4. *I. urotoma*, Stimpson.

** *Terminal segment subtruncated at its distal end.*

a. *Body oblong-ovate.*

Front entire: epimera with the postero-lateral angles more or less projecting; terminal segment not carinated.

5. *I. metallica*, Bosc.

Front apiculate in the middle: terminal segment not carinated.

6. *I. margaritacea*, Dana.

Terminal segment carinated above; joints of the peduncle of the antennæ elongated.

7. *I. pustulata*, Risso.

β. *Body slender, filiform.*

8. *I. ? gracillima*, Dana.

*** *Terminal segment regularly rounded at its distal end.*

With a small median point: epimera of second and third segments not quite reaching to postero-lateral angles of these segments.

9. *I. Wosnesenskii*, Brandt.

Entire: epimera reaching quite to postero-lateral angles.

10. *I. lacustris*, Thomson?

IDOTEA MARINA.

Oniscus marinus, Linn. *Fauna Suecica*, p. 500 (1761); *Syst. Nat.* (ed. xii.) p. 1060 (1766); *Pennant, Brit. Zool.* iv. p. 38, pl. xviii. fig. 3 (1777); *Fabr. Mantissa Ins.* i. p. 241 (1787).

Oniscus tridens, Scopoli, *Entom. Carniolica*, p. 415 (1763); Olivier, *Encycl. Méth.* vi. p. 26 (1791).

- Idotea entomon*, Pennant, *Brit. Zool.* iv. p. 38, pl. xviii. fig. 5 (1777);
Leach, Edinb. Encycl. vii. p. 404, pl. cccxi. fig. 7; *Trans. Linn. Soc.*
 xi. p. 364 (1815); *nec Oniscus entomon*, Linn.
- Oniscus balthicus*, Pallas, *Spic. Zool.* (9) p. 67, pl. iv. fig. 6 (1772);
Dalyell, Powers of Creator, Crust. i. p. 228, pl. lxiii. figs. 5-9
 (1851).
- Asellus marinus* (pt.), Olivier, *Encycl. Méth.* iv. p. 254 (1789).
- ? *Cymothoa marina*, Fabr. *Ent. Syst.* ii. p. 506 (1793).
- ? *Cymothoa acuminata*, Fabr. *t. c.* p. 508 (1793).
- ? *Idotea marina*, Fabr. *Ent. Syst. Suppl.* p. 303 (1798); *nec Latr.*
Hist. Nat. Cr. & Ins. p. 367, pl. lviii. fig. 5 (1803); *nec Lam. Hist.*
des Anim. sans Vert. v. p. 160 (1818).
- ? *Idotea acuminata*, Fabr. *Ent. Syst. Suppl.* p. 303 (1798); *Latr. Hist.*
Nat. Crust. & Ins. vi. p. 369 (1803); *Eichwald, Fauna Caspio-Cau-*
casia, p. 185, pl. xxxvii. fig. 6 (1841).
- Idotea pelagica*, Leach, *Trans. Linn. Soc.* xi. p. 365 (1815); *Desm.*
Consid. Crust. p. 289 (1825); *Latr. Cours d'Ent. Atlas*, p. 12, pl. xviii.
 figs. 20, 30 (1831); *M.-Edw. Hist. Nat. Cr.* iii. p. 129 (1840);
White, List Crust. Brit. Mus. p. 94 (1847); *Cat. Brit. Crust. Brit.*
Mus. p. 65 (1850); *Pop. Hist. Brit. Crust.* p. 223 (1857); *Kinahan,*
Nat. Hist. Rev., Pr. of Soc. vi. p. 84 (1859); *M. Sars, Forh. Vidensk.-*
Selsk. Christ. p. 151 (1859); *S. Bate & Westwood, Brit. Sessile-eyed*
Crust. ii. p. 384, fig. (1868); *Parfitt, Rep. Devon Assoc.* vi. p. 254
 (1873); *Metzger, Jahresb. der Commiss. z. Untersuch. des deutschen*
Meeres in Kiel, Cr. p. 285 (1875); *Sim, Cat. Cr. Aberdeen*, p. 11.
- Stenosoma irrorata*, Say, *Journ. Acad. Nat. Sci. Philad.* i. p. 423 (1818);
Hitchcock, Catalogue &c. Massachusetts, p. 29 (1833); *Gould, Rep.*
Invert. Massachusetts, p. 338 (1841); *DeKay, Zool. New York*
Fauna, Cr. vi. p. 43, pl. x. fig. 42 (1844).
- Idotea tricuspida*, *Desm. Dict. des Sci. Nat.* xxviii. p. 373, pl. xlvi.
 fig. 11 (1823); *Consid. Crust.* p. 289, pl. xlvi. fig. 11 (1825); *Roux,*
Cr. de la Méditerranée, pl. xxxix. figs. 11, 12 (1830); *Gould, Rep.*
Geol. Mass. (2 ed.) p. 549 (1835); *M.-Edw. Hist. Nat. Crust.* iii.
 p. 129 (1840); *Ærsted, Nat. Tidsskr.* iii. p. 561 (1841); *Zaddach,*
 "Synopseos Crust. Prussic. Prodr. p. 10 (1844)"; *White, List Cr. Brit.*
Mus. p. 94 (1847); *id. Cat. Brit. Crust. B. M.* p. 65 (1850); *Pop. Hist.*
Brit. Crust. p. 223, pl. xii. fig. 2 (1857); *Lucas, Anim. artic. in Expl.*
Sci. Algér., Cr. i. p. 60 (1849); *Hope, Cat. Cr. Ital.* p. 26 (1851);
Burgersdijk, Annotat. de Crust. indigenis, p. 21 (1852); *Lilljeb.*
Öfvers. Vet.-Ak. Förh. (9) p. 11 (1852); *Lindström, ibid.* p. 66
 (1856); *M. Sars, Forh. Vidensk.-Selsk. Christ.* p. 151 (1859); *Kina-*
han, Nat. Hist. Rev., Pr. of Soc. vi. p. 84 (1859); *Norman, Nat. Hist.*
Trans. Northumb. i. p. 25 (1867); *id. Rep. Brit. Assoc.* p. 197 (1868),
 p. 289 (1869); *Heller, Verh. zool.-bot. Gesellsch. Wien*, xvi. p. 728
 (1866); *Marcusen, Arch. f. Nat.* xxxiii. p. 360 (1867); *S. Bate &*

Westwood, Brit. Sessile-eyed Crust. ii. p. 379, fig. (1868); *Czerniavsky, Materialia ad zoograph. ponticam comparatam*, pp. 83, 129 (1868); *Sænger, Fauna of Baltic* in "Imp. Soc. Nat. Sci. Moscow, viii. (1869);" *Münter & Buchholz, Carcin. Fauna Deutschl.* in "Mitth. d. nat. Vereins v. Neu-Pommern u. Rügen, i. (1869);" *Brady & Robertson, Ann. & Mag. Nat. Hist.* (ser. 4) iii. p. 361 (1869); *Cajander, Notiser Fauna & Flora Fennica, Cr.* p. 374 (1869); *Metzger, Naturh. Gesellsch. zu Hannover*, xx. p. 32 (1871); *id. Jahresb. der Commiss. zur wissenschaft. Untersuch. des deutschen Meeres in Kiel, Cr.* p. 285 (1875); *Möbius, Die wirbellosen Thiere der Ostsee*, p. 121 (1873); *id. Ann. & Mag. Nat. Hist.* (ser. 4) xii. p. 85 (1873); *Parfitt, Trans. Devon Assoc.* p. 254 (1873); *Stebbing, Journ. Linn. Soc. Zool.* xii. p. 148 (1874); *Bos, Bijd. Ken. Cr. Hedrioph. Nederl.* pp. 34, 67 (1874); *McIntosh, Ann. & Mag. Nat. Hist.* (ser. 4) xiv. p. 273 (1874); *id. Marine Invert. St. Andrews*, p. 151 (1875); *Stalio, Att. Istit. Venet.* (ser. 5) iii. p. 1352 (1876-77); *Hoek, Tijd. Ned. Dierk. Vereenig.* p. 41 (1876); *Lenz, Wirbell. Thiere der Travemunde Bucht*, p. 15 (1878); *Sim, Cat. Cr. Aberdeen*, p. 11; *Leslie & Herdmann, Invert. Fauna Firth of Forth*, p. 46 (1881).

Idotea Basteri, Audouin, Explic. Planches in Savigny's Egypte, pl. xii. fig. 6; *Guérin, Exp. de Morée*, iii. *Zool. Cr.* p. 49 (1832); *id. Icon. Cr. R. A.* p. 32, pl. xxxi. fig. 1; *Roux, Cr. de la Méditerranée*, pl. xxix. figs. 1-10 (1830); *Rathke, Beitr. zur Fauna der Krym, in Mém. Ac. Pétersb.* iii. p. 380 (1837); *Hope, Cat. Crust. Ital.* p. 26 (1851).

Idotea variegata, Roux, Crust. de la Médit. pl. xxx. figs. 1-9 (1830); *Guérin, Exp. de la Morée*, iii. *Zool. Cr.* p. 49 (1832); *White, List Cr. Brit. Mus.* p. 94 (1847).

Idotea (Stenosoma) pusilla, Eichwald, "Reise auf dem caspisch. Meere, i. p. 138.'

? *Idotea brevicornis, M.-Edwards, Hist. Nat. Crust.* iii. p. 130 (1840).

Idotea irrorata, M.-Edw. Hist. Nat. Cr. iii. p. 132 (1840); *White, List Cr. Brit. Mus.* p. 94 (1847); *Stimpson, Marine Inv. G. Manan*, p. 39 (1853); *Leidy, Journ. Ac. Nat. Sci. Phil.* iii. p. 150 (1855); *Harger, Rep. U.S. Fish Com.* pt. i. p. 569, pl. v. fig. 23 (1874); *id. Pr. U.S. Nat. Mus.* ii. p. 160 (1879), vi. *Isopoda*, p. 343, pl. v. figs. 24-26 (1880); *Verrill, Am. Journ. of Sci. & Arts*, vii. pp. 131, 135 (1874); *id. Pr. Amer. Assoc.* pp. 369, 371, 373 (1874); *id. Rep. U.S. Fish Com.* pt. i. p. 316 (1874); *Whiteaves, Am. Journ. of Sci. & Arts* (ser. 3) vii. p. 217 (1874); *id. Further Dredging G. St. Lawrence*, p. 15 (1874).

? *Idotea tricuspis, DeKay, Zool. New York Fauna, Cr.* p. 42, pl. ix. fig. 35 (1844).

? *Idotea brevicauda, Dana, Am. Journ. of Sc. & Arts* (ser. 2) viii. p. 426 (1849); *id. U.S. Expl. Exp.* xiv. (*Cr.* ii.) p. 702, pl. xlvi. fig. 4 (1853).

? *Idotea Slabberii, Bos, Bijd. Cr. Hedrioph. Nederl.* pp. 35, 69, pl. i. figs. 12, 13 (1874).

Idotea baltica, Meinert, Nat. Tidsskr. xi. p. 81 (1877).

Body smooth, moderately convex, and not tuberculated or rugose. Head with the antero-lateral angles very little prominent and rounded, the anterior margin very slightly emarginate. First thoracic segment with the antero-lateral lobes subacute and not quite reaching to the eyes. Postabdomen about equalling in length the five preceding thoracic segments; terminal segment with the sides straight and slightly convergent to the distal extremity, which is usually more or less tridentate, with the postero-lateral lobes (or lateral teeth) rounded and much less prominent than the median tooth, which is obtuse; there are usually more or less marked indications of a median keel on the dorsal surface of the segment. In other, even adult, examples there are no indications of any except the median tooth. Eyes small. Antennules with the basal joint little dilated, not reaching beyond the penultimate joint of the peduncle of the antennæ in the adult. Antennæ, when retracted, about reaching to the posterior margin of the fourth thoracic segment, with the last peduncular joint a little longer than the preceding; flagellum with not more than 20 joints, and usually about 16 in the adult. Legs slender; epimera of second to fourth segments more or less oblong and reaching to the posterior margin of the segment, those of sixth and seventh segments with the postero-lateral angles acute. Posterior plates of the operculum sub-oblong, longer than broad in the adult. Colour very variable. Length of an adult male does not usually exceed $1\frac{1}{8}$ inch (30 millim.), breadth rather more than $\frac{1}{3}$ inch (9 millim.).

The variability of *I. marina* in regard to its colour, markings, and the length and number of articulations in the antennæ, which are generally shorter in the young individual, has been commented on by Messrs. S. Bate and Westwood, Parfitt, and other authors. The younger examples, in their more convex and narrower body, shorter antennæ, and obsolete postero-lateral teeth of the terminal segment, are generally of the form designated by Leach *I. pelagica*. The largest example in the Museum collection (a male from the Shetlands) is nearly $1\frac{5}{12}$ inch in length; in it the antennules do not reach to the end of the antepenultimate joint of the antennæ, and the median posterior tooth of the terminal segment is prominent and elongated. In most of the Mediterranean examples I have seen the median posterior tooth of the terminal postabdominal segment is very short, in some almost obsolete. These may be designated var. *Basteri*, Audouin. It may be convenient to retain

the name var. *pelagica*, Leach, for that variety or condition of this species in which the postero-lateral teeth are absent and the postero-lateral angles rounded 'off' to the terminal tooth or cusp.

The range of this species, as far as ascertained, extends throughout the Mediterranean and Black and Caspian Seas, along the western coasts of Europe northward to Great Britain (Shetlands); it occurs also on the shores of the Netherlands, in the German Ocean and Baltic, on the Scandinavian and Finlandic coasts, on the eastern coast of North America, from Nova Scotia and the Gulf of St. Lawrence southward, at least as far as Egg Harbour (Harger). It occurs on the South-American coast at Desterro and Rio Janeiro in Brazil. Its range on that coast in a southerly direction is as yet unascertained; but the occurrence of specimens, which to all appearance are not specifically distinct, on the New-Zealand coasts points to the probability of its passing southward until it reaches the Antarctic or Southern circumpolar area of distribution. Scarcely explicable by our present theories of the distribution of the recent Crustacea is the fact of its occurrence in the Red Sea, and possibly at Java.

It may be that a more attentive examination of a larger series than I have had at my disposal would reveal the existence of several distinct geographical subspecies or races; but it is certain that even if this be so, they must pass into one another by almost imperceptible gradations, and I have thought it better (on the principle of admitting, as far as possible, none but well-defined species into the present revision) to unite all at present under one specific designation.

The British-Museum collection includes a large number of specimens from various parts of the British coasts, England and Scotland (Colonel Montagu and Dr. Leach), Northumberland (purchased), Weymouth, a young example (Dr. Gray), Cornwall (D. W. Mitchell and W. P. Cocks), Cardiff (R. Drane), and Dalkey Sound, Ireland (Dr. Kinahan), Bell Rock (Dr. Leach, types of *I. pelagica*), and Beerhaven (Sir P. Egerton). All of the above are preserved dry. Two fine males from the Shetland Islands (R. MacAndrew), one from Anstis's Cove, Torquay (Rev. T. R. R. Stebbing), and two from Vineyard Sound, Massachusetts, presented by the Smithsonian Institution (as *I. irrorata*), and collected by the U.S. Fish Commission, are preserved in spirits.

There are also dried specimens from Genoa and Sicily (Old Collection), three of unknown locality collected during the voyage of H.M.S. 'Herald,' and two from Egg Harbour, United States (T. Say), designated *I. irrorata*; one also from Pictou, Nova Scotia, to which White applied the name of *I. oxyura*.

In the fine series preserved in spirit in the Paris collection are the type specimens of the *Idotea tricuspidata* of Desmarest, from La Rochelle, and of Milne-Edwards, from Oran. The former well represents what may be considered the typical condition of the species, in which the median lobe of the distal end of the terminal segment is considerably more prominent than the lateral ones, which yet are distinct, and the body is of somewhat oblong-oval shape.

In this collection there are specimens from Iceland (Cape Research), Bohuslan (Malm), Dublin (Kinaban), the Channel, Bona on the Algerian Coast (M. Lucas and M. Letourneux). From the latter locality a large series of specimens show great variation in the purplish markings of the body, but very little in the form of the terminal segment, in which the median tooth of the posterior margin is very short; the same is true of the very numerous series from the Channel.

I have also had under my examination the types (all more or less imperfect) of *Idotea brevicornis*, M.-Edwards, from Australia ("Baie des chiens marins," M. Freycinet), and cannot regard them as specifically distinct from *I. marina*. The differences mentioned by Milne-Edwards in his description cannot be considered of specific importance, in view of the great degree of variability now ascertained to exist in European specimens of this species.

A male from the Red Sea (M. Clot-Bey) is of large size, with largely-developed posterior epimera, and terminal segment with a prominent median tooth. Another from Java (Exp. de la 'Chevette') is in fragmentary condition, but probably belongs to this species. Three specimens (male and two females) are in the collection from Brazil, Desterro (Dr. F. Müller), which closely resemble, except for their pale colour, specimens from the Mediterranean and British Channel, and a male from New Zealand (M. Petit); also a female from the Atlantic Ocean (M. A. Edwards) designated *I. brevicauda*.

In the Linnean Cabinet at the rooms of the Linnean Society in Burlington House is a specimen which bears the name "*maris-*

mus," in what is undoubtedly Linnæus's handwriting*. Hence I have little hesitation in citing his name for this species. Latreille and Lamarek apparently confounded two distinct species under the name *I. marina*.

The *Idotea brevicauda*, Dana, from Rio de Janeiro, I believe to be synonymous with *I. marina*, although, in the remarks following the specific description, the author says, "Like the front, the centre of the caudal margin is apiculate." According to the specific description, however, and the figure, the front is truncated, without any median prominence.

The small example figured by Dana (pl. xlvi. fig. 5) as possibly the young of this species is designated above *I. Danai*.

The species designated *I. tricuspidata* by Catta, Ann. Sci. Nat. (ser. 6) iii. p. 31 (1876), appears, from the description of the terminal segment, not to be referable to *I. marina*. It may perhaps be *I. metallica*, Bose.

Idotea Slabberii, Bos (*t. c.*), is, according to its author, only distinguished by its more oblong form and relatively shorter antennæ; the figure, which is a mere outline sketch, is obviously inaccurate as regards the segmentation of the postabdomen and the form of the epimera. It appears to represent var. *pelagica*.

IDOTEA MARINA, VAR. PHOSPHOREA.

Idotea oxyura, White (*ined.*).

Idotea phosphorea, Harger, Rep. U.S. Fish Commission, i. p. 569 (1874), vi. p. 347, pl. v. figs. 27-29 (1880); *id. Proc. U.S. Nat. Mus.* ii. p. 160 (1879); Verrill, *Am. Journ. Sci. & Arts*, (ser. 3) vii. pp. 43, 45, 131 (1874); *id. Rep. U.S. Fish Commiss.* i. p. 316 (1874); *Whitcaves*, *Am. Journ. Sci. & Arts*, (ser. 3) vii. p. 218 (1874); *id. Further Dredging G. St. Lawrence*, p. 15 " (1874)."

This variety (or possible species) is nearly allied to *I. marina*, but may be distinguished by its rougher and more tuberculate body, and generally by its more acute terminal postabdominal segment, which, in the specimens I have seen (and in Harger's figure), is rounded off at the distal end to the median terminal tooth, which is somewhat produced. The epimeral sutures of the second and third thoracic segments do not completely cross the segment, but allow the rounded postero-lateral lobes of these segments to form a part of the lateral margin. Length about 1 inch (25 mm., Harger), breadth rather more than $\frac{1}{4}$ inch (7 mm.).

* The label has been pronounced to be in the handwriting of Linnæus by Dr. Ewald Åhrling of Arboga, Sweden, a gentleman well versed in all matters concerning the MSS. and correspondence of Linnæus.

As we learn from Mr. Harger's Report, it is found associated with the last among rocks and weed along the entire coast of New England, and extends northward to Halifax, Nova Scotia, and the Gulf of St. Lawrence. It appears to have a more northern range on that coast than *I. marina*. The colour is very varied, but never of the striped pattern so common in *I. marina*.

To this form belong two out of three specimens from Pictou, Nova Scotia (Lieut. Redman), in the collection of the British Museum, to which White applied the MS. name of *I. oxyura*. The third specimen I refer to *I. marina*. Nearly allied as the two forms undoubtedly are, the character of the epimera, with the other distinctions mentioned, apparently suffice to distinguish them, at least as varieties.

There appears to be no sufficient reason to distinguish *Idotea granulosa* of Rathke (Beitr. Fauna Norwegens, in Nov. Act. Nat. Curiosorum, xx. p. 23, 1843), from Christiansund and Drontheim, from the American *I. phosphorea*. Rathke's specimens scarcely differ (according to his description), except in their shorter antennæ and colour, characters of little value. His specimens were of small size (6 lines), but have a granular carapace, and the form of the terminal postabdominal segment is similar. As, however, the form of the epimera is not mentioned, I retain for the present Harger's name for the specimen from Nova Scotia in the Museum collection.

IDOTEA OCHOTENSIS. (Plate I. figs. 8-10.)

Idotea ochotensis, Brandt, in Middendorff's *Sibirische Reise*, ii. Cr. p. 145, pl. vi. fig. 33 (1851).

In this species the body is elongated, raised like a keel in the middle of the line, sloping, smooth, and naked on the sides. The anterior frontal margin is deeply emarginate and compressed posteriorly; antero-lateral lobes very conspicuous, arcuated, bent downward and forward, so as wholly to cover the basal antennal joint. All the thoracic segments broad on the sides, very straight-edged, with their posterior and inferior angles more or less right angles. Postabdomen composed of three distinct segments, the terminal segment much elongated, quadrangulate, with straight lateral margins; posterior margin with a triangulate tooth-like process, which gives out a keel that extends along the whole length of the dorsal surface of the segment in the median line. Eyes small. Antennules short, not reaching to the end of the

third joint of the peduncle of the antennæ. Antennæ, when retracted, reaching to about the posterior margin of the fourth thoracic segment; flagellum about 15-jointed and shorter than the peduncle. Epimera of the second to fourth thoracic segments occupying scarcely more than the anterior half of their lateral margins, of the fifth and sixth segments about three quarters, and of the seventh segment the whole of the lateral margins. Colour very variable: back reddish brown or olive-green, often with yellow clouded or dot-like markings, or even with a yellowish stripe on the back.

This species was obtained by Middendorff in the Sea of Ochotsk, and by Wosnesensky in Awatscha Bay. Its range, as far as ascertained, extends along the eastern coast of Asia northward from the Sea of Japan, and along the west coast of N. America southward to British Columbia and Vancouver Island.

A fine male in the British-Museum collection, length nearly $1\frac{3}{4}$ inch (43 mm.), preserved in spirits, and collected by Capt. St. John off the N.E. of Yedo Island (J. Gwyn Jeffreys), differs from Brandt's figure of *I. ochotensis* only in its relatively longer and slenderer body and somewhat shorter antennæ, which, when retracted, would not reach to the posterior margin of the fourth thoracic segment, but whose peduncular joints are longer than in Brandt's figure; the flagellum is 13-jointed.

On the other hand, a male of smaller size, in spirit, from British Columbia (J. K. Lord), length about $1\frac{1}{2}$ inch (28 mm.), much more nearly resembles Brandt's figures in these particulars; but the keel-like elevation of the median dorsal line of the thorax is obsolete; the flagellum of the antennæ is 18-jointed.

In a small example (in spirit), length nearly $\frac{3}{4}$ inch (18 mm.), obtained at Vancouver Island (Boundary Commission), the antennæ are yet longer, reaching beyond the posterior margin of the fifth thoracic segment, the flagellum longer than the peduncle and 19-jointed, the dorsal keel of the thorax and terminal segment is obsolete, and the tooth at its distal extremity, which is very prominent in the large male from Japan, but less so in the specimen next referred to, is in this quite obscurely defined. Having regard to the marked variations which exist between the adult and young of some other species (e.g. *I. marina*), I will refer all three specimens, provisionally at least, to *I. ochotensis* rather than incur the possibility of further complicating the synonymical references in this genus by unnecessary specific names.

In Brandt's figure and in the British-Columbian examples the postabdomen about equals the last four thoracic segments in length. In the Japanese example the postabdomen about equals $3\frac{1}{2}$ segments.

In the collection of the Paris Museum is a male (Mus. St. Petersburg) that agrees very nearly with the above description, but the keel on the terminal segment is partially obsolete, antennæ 14-15-jointed; in two males from the Amur (M. A. Edwards) the keel is obsolete and the flagellum (only one perfect) 11-jointed. A fine male without locality (Exped. de la Vénus, M. Nébox) has no trace of a dorsal keel, and has a 12-jointed antennal flagellum.

The *Idotea rectilinea* of Lockington (Proc. Cal. Acad. Sci. vii. pt. i. p. 36, 1877) is described as having the body slender, all the thoracic segments equal in length and width. Postabdomen rectilinear, nearly as wide as the thorax, with the first two segments distinct; its total length about equal to that of the last three thoracic segments; its posterior extremity obtusely pointed. Antennæ long; peduncle equal in length to the three first segments of the body; flagellum broken in both specimens. Colour variable: one dried specimen almost entirely black, the other with a black line down centre of body, the rest of which is yellowish. Length 0·80 inch, width 0·17 inch.

Loc. San Diego.

Nothing is stated concerning the epimera; but, as far as the description goes, this species is scarcely to be distinguished from the foregoing.

IDOTEA UROTOMA.

Idotea urotoma, Stimpson, *Pr. Ac. Nat. Sci. Phil.* p. 155 (1864).

According to Stimpson, this has the body nearly linear, nearly five times as long as broad, broadest at the sixth thoracic segment. Postabdomen consisting of three joints, with the partial separation of a fourth, subrectangular, with convex extremities, and scarcely less broad at its truncate posterior extremity than at the anterior. The posterior extremity is peculiar in shape, the angle on either side projecting strongly, and separated by a tooth from the convex or subtriangular middle portion, which bears a small tooth at the middle. Antennæ a little more than half as long as the body; last two joints of the peduncle subequal; flagellum a little shorter than the peduncle and 10-jointed. Thoracic legs

slender. Opercular valves large, nearly covering the entire under-side of the postabdomen. Length of body 0·75 inch, greatest breadth 0·17; length of postabdomen 0·20 inch.

Hab. Puget Sound (Stimpson).

I have seen no specimens having the peculiar form of the terminal postabdominal segment as described above. In other particulars this species appears to be allied to *I. ochotensis*.

IDOTEA ? GRACILLIMA.

Stenosoma gracillimum, Dana, *Pr. Acad. Nat. Sci. Philad.* vii. p. 175 (1854); *Stimpson, Bost. Journ. Nat. Hist.* vi. p. 505 (1857).

Has, according to Prof. Dana, an extremely slender filiform body, with the thoracic segments for the most part subquadrate; head quadrate. Postabdomen linear, truncated at apex, 3-jointed, third segment marked on each side with a suture. Antennæ a little shorter than half the body, with the flagellum 10-12-jointed, shorter than the peduncle, naked. Legs very short, subequal. Length $5\frac{1}{2}$ lines.

Loc. California (Dr. J. LeConte).

This species is very briefly described; but I have seen no specimens which can be referred to it.

IDOTEA METALLICA.

Idotea metallica, Bosc, *Hist. Nat. Crust.* ii. p. 179, pl. xv. fig. 6 (1802); *Latr. Hist. Nat. Cr. et Ins.* vi. p. 373 (1803).

? *Idotea atrata*, Costa, *Fauna del R. Napoli, Cr.* pl. xi. fig. 3 (1838); *Hope, Cat. Cr. Ital.* p. 26 (1851).

Idotea rugosa, M.-Edw. *Hist. Nat. Crust.* iii. p. 131 (1840).

? *Idotea peloponesiaca*, Roux, *Cr. de la Méditerranée*, pl. xxx. figs. 10, 12 (1830); *Hope, Cat. Cr. Ital.* p. 26 (1851).

Idotea robusta, Krøyer, *Naturhist. Tidsskr.* (ser. 2) ii. p. 108 (1846); *id. Voy. en Scand., Crust.* pl. xxvi. fig. 3; *Reinhardt, Forteg. over Grönlands Krebsdyr*, p. 35 (1857); *Stimpson, Pr. Ac. Nat. Sci. Phil.* p. 133 (1863); *Verrill, Am. Journ. Sci. & Arts*, ii. p. 360 (1871); *id. Rep. U.S. Fish Commiss.* i. p. 439 (1874); *Harger, same Report*, i. p. 569, pl. v. fig. 24 (1874); *Proc. U.S. Nat. Mus.* ii. p. 160 (1879); *Rep. U.S. Fish Commiss.* vi. p. 349, pl. vi. figs. 30-32 (1880); *Lütken, List of Crust. of Greenland, in Arctic Manual*, p. 150, footnote (1875).

Idotea compacta, White, *List Crust. Brit. Mus.* p. 95 (1847).

? *Idotea algirica*, Lucas, *Anim. artic. in Expl. Sci. Algérie*, i. Cr. p. 61, pl. vi. fig. 2 (1849); *Heller, Verh. zool.-bot. Gesellsch. Wien*, xvi. pp. 727, 728 (1866); *Stalio, Att. Istit. Venet.* (ser. 5) iii. p. 1353 (1876-77).

Idotea argentea, Dana, *Amer. Journ. of Sci. & Arts*, (ser. 2) viii. p. 426 (1849); *id. U.S. Explor. Exped., Crust.* xiv. p. 698, pl. xvi. fig. 1 (1853); *Miers, Cat. New-Zealand Crust.* p. 92 (1868).

Idotea annulata, Dana, *Amer. Journ. of Sci. & Arts*, (ser. 2) viii. p. 426 (1849); *id. U.S. Explor. Exped. Crust.* p. 701, pl. xvi. fig. 3 (1853); *Cunningham, Trans. Linn. Soc.* xxvii. p. 499 (1871); *nec Miers, Proc. Zool. Soc.* p. 76 (1881).

This species is oblong-oval, moderately convex, the somewhat projecting epimera usually giving, in the adult, a serrated appearance to the sides of the thorax. The head is transverse, with the anterior margin slightly concave; the antero-lateral angles rounded and but little prominent; near the posterior margin of the head is a deeply impressed arcuated transverse furrow. The surface of the body is more or less rugose; the lateral sutures on the dorsal surface of the postabdomen posterior to the second segment are strongly marked, nearly straight, and directed obliquely upward toward the middle line of the body; the terminal segment is convex, nearly oblong, rounded at the postero-lateral angles; posterior margin square-truncated, or very slightly excavated, or with a very obscure median denticle. The eyes are large and prominent. The terminal joint of the peduncle of the antennæ longer than the preceding; the flagellum short, usually 7-10-jointed. The epimera are well developed, with the postero-lateral angles subacute and usually somewhat projecting in the adult; the basal plate of the opercular valves is oblong, with parallel sides; the terminal plate nearly square, but rounded off at its externo-distal angle. The length of an adult male may exceed 1 inch (28 millim., Harger); but the majority of the specimens in the Museum collection do not exceed $\frac{2}{3}$ inch (17 millim.).

The colour, according to Harger, is bright blue or green when alive, becoming darker and duller in alcohol, without the markings of the other species, but often with metallic reflections. In by far the greater number of specimens that I have seen, whether preserved dry or in spirit, the lateral margins of the epimera are paler, and there is a more or less distinct transverse band of pale colour on the posterior margin of the terminal segment.

The robust antennæ, large eyes, rugose thoracic segments, and square-truncated terminal postabdominal segment will always distinguish this species from varieties of *Idotea marina* with the lobes of the terminal segment obsolete.

This is apparently a very common and almost cosmopolitan

pelagic species, occurring probably everywhere, except in Arctic and Antarctic latitudes. Specimens from the open sea, but without indication of locality, are in the Museum collection, obtained during the voyages of H.M.S.S. 'Herald' and 'Rattlesnake,' &c.; three males and two females in spirit from the N. Atlantic, lat. $55^{\circ} 49'$ N., long. $16^{\circ} 44'$ W. ('Valorous' Exped., as *I. robusta*); from the N. Atlantic, lat. 20° N., long. $22^{\circ} 53'$ W., an adult male and four smaller specimens, and lat. $31^{\circ} 30'$ N., long. $23^{\circ} 0'$ W., an adult male, female with ova, and young, both obtained from the towing-net and preserved in spirit; a young example, in spirit, from the Mediterranean; an adult male and two females, in spirit, from the Atlantic (Capt. J. B. Godfrey); two males, in spirit, from Vineyard Sound, Massachusetts (U.S. Fish Commiss., as *I. robusta*); a male and two females from W. Africa (Bewsher); a series of specimens from the South Atlantic, lat. $34^{\circ} 43'$ S., long. 4° W., and lat. $35^{\circ} 21'$ S., long. $35^{\circ} 22'$ W., preserved dry, and collected by J. MacGillivray (H.M.S. 'Rattlesnake'); several specimens, in spirit, collected between Monte Video and the Straits of Magellan (Dr. R. O. Cunningham, as *I. annulata*); a series of specimens, in spirit, from the S. Pacific, lat. $25^{\circ} 18'$ S., long. $178^{\circ} 54'$ W. (H.M.S. 'Herald,' as *I. pelagica*); three specimens (preserved dry) from Cape Byron, N. S. Wales (collected by J. MacGillivray, H.M.S. 'Rattlesnake'), and one, dry, from Borneo (Admiralty), designated by White as *I. compacta*; besides others, whose locality has either never been recorded or has been lost.

It is remarkable that no specimen should (so far as I am aware) have as yet been recorded from the British coasts.

I have observed considerable variation in the degree of prominence of the epimera and in the width of the thoracic segments. In some, even adult, examples the epimera do not project at all, and the serrated appearance of the sides of the thorax is lost. The younger individuals are generally narrower, with the sides more nearly parallel.

I think that the *I. peloponesiaca* of Roux is to be referred to this species rather than to *I. emarginata*, where M. Roux and S. Bate and Westwood place it, on account of the prominent eyes, serrated lateral margins of the thorax, and the coloration. The terminal segment is described as convex and truncated, although represented as slightly emarginated. Guérin, Exp. de Morée, Cr. p. 49 (1832), adds no information about this species.

In the large series in the collection of the Paris Museum the following are of interest on account of the locality:—specimens of both sexes from Algiers (M. Lucas), and designated *Idotea algirica*, Lucas; the type specimens of *I. rugosa*, M.-Edw., from the open sea, Indian Ocean, and other specimens from Sumatra (M. Bourdes), designated *I. rugosa*; one of these measures $1\frac{1}{8}$ inch (30 mm.) in length: also examples from St. Helena (Dussumier); Teneriffe (Quoy & Gaimard), small and of pale colour; a fine series from the Cape of Good Hope, and four specimens from Port Jackson (M. Freycinet), &c.

In the specimens designated *I. algirica* by Lucas the body is not pubescent, and the lateral serratures caused by the projecting epimera, although strongly marked, are not so prominent as in Lucas's figure. Dr. Heller notes the occurrence of this species, but rarely, at Lesina.

Idotea brevicornis of Rathke, nec Edw., "Beitr. zur Fauna Norwegens," in Nova Acta Acad. Cæs. Nat. Curiosorum, xx. p. 24 (1843), from Christiansund, is described too briefly for me to be certain of its systematic position. The eyes are very large and black; the antennæ have a 7-8-jointed flagellum and are altogether very thick, and reach, at farthest, to the second thoracic segment; the postabdomen is in its posterior portion not so much ridged as very bluntly angulated; it is rounded at the end, with only very feeble indications of a median apical point; moreover the postabdomen is short, compressed, and but little narrowed towards its apex. The legs are short and thick, yet the posterior pair reaches, because of the smallness of the postabdomen, a little beyond it, which is not usual in the genus *Idotea*. Colour olive-green, in some specimens approaching black, in others yellow; no mottlings were noticed. Length of a male not exceeding $7\frac{1}{2}$ lines; female much smaller.

It is not improbably identical with *I. metallica*.

IDOTEA MARGARITACEA.

Idotea margaritacea, Dana, *U.S. Explor. Exped.* xiv. *Crust.* p. 700, pl. xlvi. fig. 2 (1853); *Miers, Cat. New-Zeal. Crust.* p. 92 (1876).

Is apparently very closely allied to the preceding species, and should perhaps not be regarded as distinct from it. Dana, however, describes the front as 3-toothed, the three teeth very low, one occupying either angle, and the third, which is less distinct, the middle of the front; the outer are subacute, and the spaces

between low-concave; the body is not quite as much narrowed behind, and the flagellum of the outer antennæ has but four or five joints. It was obtained between Australia and Southern New Zealand, five hundred miles from Port Jackson, N. S. Wales.

I have never observed any specimens of *I. metallica* with a tridentate front.

IDOTEA PUSTULATA.

Armida pustulata, Risso, *Hist. Nat. Eur. mérid.* v. p. 110 (1826).

This species is apparently allied to *I. metallica* and *I. ochotensis*. It is described as follows:—"Body of a deep bluish grey, with all the segments acute on the sides; head pustulated; eyes black; the first four joints of the antennæ elongated, the fifth longer, the others very short; the four joints of the antennules as long as the two first antennal joints; 'palpi' pectinated; legs somewhat roughened; segments of postabdomen narrow, the last carinated, almost truncated at apex." Length about 1 inch (25 millim.), breadth rather more than $\frac{1}{4}$ inch (7 millim.).

It is apparently distinguished from *I. metallica* by the longer peduncular joints of the antennæ and the carinated terminal segment, wherein it resembles *I. ochotensis*; but whether it be really distinct could only be determined by examination of specimens. It is probably the species referred to by Hope (*Cat. Crust. Ital.* p. 26, 1851), without description, under the designation *Armida punctulata*, Risso.

? IDOTEA LACUSTRIS. (Plate I. figs. 11 & 12.)

Idotea lacustris, Thomson, *Trans. New-Zeal. Inst.* xi. p. 250 (1879).

Is described by Mr. Thomson as having the body narrow-elliptical, little more than twice as long as broad; front of head excavated, not toothed; first segment of thorax somewhat longer than those succeeding, which are subequal; postabdomen three-jointed, terminal joint (formed of three coalescent segments) hardly narrowing to the rounded extremity; antennules not half as long as the base of the antennæ, 4-jointed, joints subequal; antennæ one third as long as the body; flagellum 9-11-jointed, with a dense fringe of very short setæ on the outer margin; epimera nearly square, the last three slightly produced posteriorly. Colour dark grey mottled with brown, with a duller median band extending from the head to near the extremity of the postabdomen. Length $\frac{2}{5}$ inch,

Numerous specimens were found in the Tomahawk lagoon, near Dunedin (Prof. Hutton). They were creeping about under stones, and appeared to be feeding on the ova of a fish, probably *Galaxis*, which was found abundantly in the same locality. It is chiefly remarkable, as Mr. Thomson points out, for its occurrence in fresh water, though whether it lives there permanently or only comes up when a very high tide renders communication with the lagoon possible, is uncertain.

The freshwater habitat is not peculiar to this species, since Prof. Lovén has detected *Glyptonotus entomon* in the Swedish lakes (Öfvers. Vetensk.-Akad. Förhandl. Stockholm, xviii. p. 286, 1862.)

In numerous females the incubatory pouch extended along the whole undersurface of the thorax. The young animals, taken out of this sac, have their bodies somewhat elongated in shape, with all the segments developed and appendages present, but having the outer antennæ furnished with a flagellum of only one joint, and a few short setæ.

The figure is from specimens in the British-Museum collection from Port Henry, Straits of Magellan (Dr. R. P. Copping), that agree fairly well with the above description, but which I refer with much hesitation to *I. lacustris*, on account of the widely-remote locality at which they were obtained and their (probable) marine habitat. I at first (Proc. Zool. Soc. 1881, p. 76) referred them with doubt to *I. annulata*, Dana, a species that in this revision is regarded as synonymous with *I. metallica*. The colour in these specimens is of a uniform chestnut-brown, the front margin of the head very slightly excavated, and the flagella of the antennæ 7-jointed. If distinct, they may be designated *I. rotundicauda*.

IDOTEA WOSNESENSKII.

Idotea Wosnesenskii, Brandt, in Middendorff's *Sibirische Reise*, Zool.

ii. Cr. p. 146 (1851); Stimpson, *Bost. Journ. Nat. Hist.* vi. p. 504 (1857); S. Bate, in *Lord's Nat. in Brit. Columbia*, ii. p. 281 (1866).

Idotea hirtipes, Dana, *Cr. U.S. Expl. Exp.* xiv. (2) p. 704, pl. xlvi. fig. 6 (1853), nec M.-Edwards.

Idotea oregonensis, Dana, *Pr. Acad. Nat. Sci. Phil.* vii. p. 175 (1854).

Idotea media (Dana?), S. Bate, in *Lord's Nat. in Brit. Columbia*, ii. p. 282 (1866).

Is characterized by its oblong-oval, convex body, which is relatively shorter and broader than in *I. ochotensis*, and is without

a median dorsal keel. Head nearly smooth, its antero-lateral angles rounded and not prominent, and its anterior margin very slightly sinuated or nearly straight, the impressed line near the posterior margin faintly marked or quite obsolete. The first thoracic segment has its antero-lateral angles anteriorly produced and broadly rounded, the two following segments less distinctly so; all the thoracic segments are of nearly equal length in the median dorsal line. The terminal postabdominal segment is convex, not $1\frac{1}{2}$ times as long as broad, bluntly rounded at its distal end, with a small blunt median terminal tooth, posterior to which is usually indicated a longitudinal median keel, which is prolonged backward for a short distance on the dorsal surface of the segment. Eyes small. Antennules very short, not reaching to the distal end of the antepenultimate joint of the peduncle of the antennæ. The antennæ, when retracted, do not surpass the posterior margin of the third thoracic segment; the last two joints of the peduncle are short, subequal, each scarcely longer than the antepenultimate joint; flagellum 12-14-jointed. Epimera of second to fourth thoracic segment narrow-linear and not reaching quite to the postero-lateral angles of these segments; the epimera of the fifth to seventh thoracic segments become successively broader, and reach to the postero-lateral angles of the segments. The terminal joints of all the legs are usually armed with a small accessory claw; the terminal plates of the operculum are not oblong, but have their exterior margins regularly arcuated. Length of an adult male about $1\frac{1}{4}$ inch (32 millim.), breadth about $\frac{5}{12}$ inch (11 millim.).

This species ranges from the Sea of Ochotsk and Kamtchatka Sea, along the western coast of North America, to the coast of California.

Specimens are in the British-Museum collection, preserved dry, from Vancouver's Island (J. K. Lord, as *I. Wosnesenskii* and *I. media*), and in spirit (of both sexes) from Skedegate Bay, Queen Charlotte Island (purchased of Dr. Brown); also a male from Fort Rupert (Dr. Brown), and three males from San Francisco, California (W. N. Lockington, as *I. Wosnesenskii*).

In the Paris collection is an adult male of large size, with very robust and hairy legs, from Unalaschka, three examples from California (with *I. Whitei*), and two small specimens, without locality, designated *I. oregonensis*; also a good series from the Gulf of Georgia (A. Agassiz).

of *I. ochotensis*, being more angulated and less rounded at the postero-lateral angles. The colour (of the spirit-specimens) is a purple-pink, with markings of light yellow and darker brownish pink. Length of the largest example rather more than 1 inch (27 millim.).

It is possible that the examination of a larger series would demonstrate the necessity of uniting this species with *I. Wosnesenskii*.

b. *Terminal segment distinctly emarginate at its distal end.*

The species of this subsection may be distinguished as follows:—

* *Epimera broad, those of the second to fourth segments occupying the whole of the lateral margins.*

Oblong-ovate: terminal segment with the postero-lateral angle subacute.

1. *I. emarginata* (Fabr.).

** *Epimera of second to fourth thoracic segments occupying the anterior part of the lateral margin.*

Oblong-ovate: antennæ not as long as the cephalothorax; terminal segment deeply emarginate, with acute postero-lateral angles.

2. *I. resecata*, Stimpson.

Slender: antennæ robust, as long as the body (in the adult); terminal segment sometimes with a small median cusp, postero-lateral angles acute.

3. *I. linearis* (Linn.).

Oblong-ovate: antennæ not as long as the cephalothorax; terminal segment very slightly emarginate, postero-lateral angles subacute.

4. *I. indica*, M.-Edw.

*** *Epimera not distinguishable in a dorsal view.*

Suboblong: body dorsally carinated; terminal segment deeply emarginate, with acute postero-lateral angles.

5. *I. hectica* (Pallas).

IDOTEA EMARGINATA.

? *Squilla marina*, De Geer, *Mém. Hist. des Ins.* vii. p. 522, pl. xxxii. figs. 11-14 (1778).

Cymothoa emarginata, Fabr. *Ent. Syst.* ii. p. 508 (1793).

Idotea emarginata, Fabr. *Ent. Syst. Suppl.* p. 303 (1798); Latr. *Hist. Nat. Cr. et Ins.* vi. p. 370 (1803); M.-Edw. *Hist. Nat. Cr.* iii. p. 130 (1840); *id. Cr. in Cuvier's Règne Anim. (éd. 3)*, pl. lxxix. fig. 2; White, *List Cr. Brit. Mus.* p. 94 (1847); *id. Cat. Brit. Cr. B.M.* p. 65 (1850); *id. Pop. Hist. Brit. Crust.* p. 224 (1857); Hope, *Cat. Cr. Ital.*

p. 26 (1851); *Kinahan, Nat. Hist. Rev., Pr. of Soc.* vi. p. 84 (1859); *S. Bate & Westw. Brit. Sessile-eyed Cr.* ii. p. 386, fig. (1868); *Brady & Robertson, Ann. & Mag. Nat. Hist.* (ser. 4) iii. p. 361; *Parfitt, Rep. Devon Assoc.* vi. p. 255 (1873); *Metzger, Jahresb. der Commiss. z. wiss. Untersuch. des deutschen Meeres*, p. 285 (1875); *Meinert, Nat. Tidsskr.* (3 R.) xi. p. 82 (1877), xii. p. 470 (1880); *Sim, List Cr. Aberdeen*, p. 11.

? *Idotea excisa*, *Bosc, Hist. Nat. des Crust.* ii. p. 181 (1802).

? *Idotea marina*, *Latr. Hist. Nat. Cr.* vi. p. 367, vii. pl. lviii. fig. 5 (1803-4); *Lam. Hist. Anim. sans Vert.* v. p. 160 (1818), *nec Linn.*

Idotea œstrum, *Leach, Linn. Trans.* xi. p. 365 (1815); *Desm. Consid. Cr.* p. 289 (1825).

The body is convex, oblong-oval, nearly smooth. Head with the anterior margin nearly straight, almost imperceptibly concave, its antero-lateral angles not at all prominent; segments of the thorax of nearly equal length in the middle line of the back, the first segment with rounded or subacute antero-lateral lobes that reach to or nearly to the eyes; postabdomen longer than the four posterior thoracic segments, terminal segment convex above, with the lateral margins nearly straight and slightly convergent posteriorly to the distal extremity, which has a rather broad and shallow emargination; the postero-lateral angles of the terminal segment are rounded or subacute, never acute. Eyes small, black. Antennules usually not reaching to the distal end of the penultimate joint of the peduncle of the antennæ, with their basal joints moderately dilated. Antennæ of moderate length, usually not reaching, when retracted, to the posterior margin of the fourth thoracic segment; the terminal joint of the peduncle but little longer than the preceding; the flagellum 12-20-jointed. Epimera large and broadly developed; those of the three or four posterior segments with the postero-lateral angles subacute. Opercular valves with the terminal plates nearly square, their distal ends slightly emarginated. The colour in dried or spirit-specimens is a more or less yellowish brown, the surface of the body being covered with minute dots which are not always visible. The largest specimen I have seen measures nearly $1\frac{5}{12}$ inch (35 millim.) in length, and its greatest breadth is nearly $\frac{1}{2}$ inch (11 millim.); but adult examples are usually smaller.

This species probably occurs, but (it would seem) locally, throughout the warmer and temperate seas of Europe. It has been recorded from the Mediterranean, British, Danish, and Southern Scandinavian coasts, Heligoland, &c.

The British-Museum collection contains specimens from various localities on the British coasts (Col. Montagu and Dr. Leach) and a male from the Mediterranean, all preserved dry; also two males from Bohuslan (Dr. A. W. Malm), preserved in spirit. In the Paris collection also are two specimens from Bohuslan (Malm), and others without locality.

Mr. Norman, in Messrs. Brady and Robertson's Report on dredging in the West of Ireland, in the *Ann. & Mag. Nat. Hist.* for 1869, above quoted, mentions the occurrence of the young of this species in extraordinary abundance among Algæ between Ardbear and Mannin Bays.

In young individuals the body is relatively narrower, and the terminal notch is often shallower than in the adult.

The colour of the two small specimens obtained by Mr. Parfitt (*t. c.*) was deep chocolate or reddish brown, with a row of white ocelli-like spots along the dorsal ridge and two or three white blotches on the side; posterior edge of the tail edged with white; legs dark, and claws bright vinous red.

IDOTEA RESECATA.

Idotea resecata, *Stimpson, Bost. Journ. Nat. Hist.* vi. p. 64, pl. xxii. fig. 7 (1857); *id. Proc. Bost. Soc. Nat. Hist.* p. 88 (1859).

The body is convex along the middle line, with slight indications of a median dorsal keel. Head (in the Museum examples) smooth above, with its anterior margin distinctly emarginate; first segment of the thorax with its antero-lateral lobes broad and subtruncated; postabdomen slightly broader anteriorly, and equalling in length the four posterior thoracic segments taken together, composed of three segments, with lateral indications of a third, distal end of the terminal segment deeply emarginate, postero-lateral angles on each side prominent and acute. Eyes small. Antennules reaching to the distal end of the antepenultimate segment, with their basal joints greatly expanded, suborbiculate. Antennæ, when retracted, reaching or nearly reaching to the fourth thoracic segment; peduncle rather stout, with the last joint a little shorter than the penultimate joint; flagellum slender, 17-20-jointed. Epimera, of the second to fourth segments (in the Museum examples) linear, and occupying only a part of the lateral margins, of the fifth to seventh segments broader and occupying the whole length of the lateral margins; epimera of seventh segment with postero-lateral angles acute. Terminal plates of the operculum quadrate. Length of largest

example in the Museum collection $1\frac{1}{2}$ inch (34 millim.), breadth nearly $\frac{1}{2}$ inch (8 millim.).

Hab. West coast of N. America. Stimpson's type was dredged in the Straits of Da Fuca, opposite Fort Townsend (Capt. Murden).

There are in the British-Museum collection two males, preserved in spirit, from the Gulf of Georgia, near Orcas Island (Admiralty), and a small example, in spirit, from Vancouver Island (Boundary Commission), that I refer to this species.

IDOTEA HECTICA.

Oniscus hecticus, Pallas, *Spicil. Zool.* i. (fasc. 9) p. 61, pl. iv. fig. 10 (1772).

Asellus hecticus, Olivier, *Encycl. Méth.* iv. p. 255 (1789).

Idotea hectica, Latr. *Hist. Nat. Crust. et Ins.* vi. p. 371 (1803); Lam. *Hist. des Anim. sans Vert.* v. p. 160 (1818); ? *M.-Edw. Hist. Nat. Crust.* iii. p. 133 (1840); *id.*? *Cr. in Règne Anim. de Cuv.* pl. lxxix. fig. 1; White, *List Cr. Brit. Mus.* p. 95 (1847); Lucas, *Anim. artic. in Expl. Sci. Algérie, Cr.* p. 62 (1849); Heller, *Verhandl. zool.-bot. Vereins Wien*, xvi. p. 727 (1866); Stalio, *Att. Istit. Venet.* (ser. 5) iii. p. 1352 (1876-77).

Idotea viridissima, Risso, *Cr. des environs de Nice*, p. 136, pl. iii. fig. 8 (1816).

Gonotus viridis, Rafinesque-Schmaltz, *Précis des déc. Somnologiques*, p. 26 (1814).

Stenosoma hecticum, Desm. *Consid. Cr.* p. 291 (1825).

Armida viridissima, Risso, *Hist. Nat. Eur. mérid.* v. p. 109 (1826).

? *Stenosoma viridula*, Costa, *Cr. in Fauna del R. Napoli*, pl. iv. fig. 7 (1838); Hope, *Cat. Cr. Ital.* p. 26 (1851).

? *Stenosoma eruginosa*, Costa, *t. c.* pl. iv. fig. 6 (1838); Hope, *t. c.* p. 26 (1851).

Body elongated, narrow-oblong, but slightly narrowed towards the head, with a longitudinal median keel along the dorsal margin, which is obsolete on the terminal postabdominal segment. Anterior margin of the head with a deep, almost semicircular excavation; its antero-lateral lobes (in a dorsal view) broad and obtuse. Thoracic segments (the first excepted) of nearly equal length, with their posterior margins sinuated, and their postero-lateral angles scarcely acute; the first segment much shorter and deeply excavated anteriorly for the reception of the head. Postabdomen (in the Museum examples) about equalling in length the four posterior thoracic segments, with the first two segments quite distinct; the terminal segment somewhat depressed above, with a semicircular emargination at its distal end, and the postero-

lateral angles acute. Eyes very small, in the middle of the lateral margins. Antennules very slender, scarcely surpassing the antepenultimate peduncular joint of the antennæ, with their basal joints moderately dilated. Antennæ as long, or nearly as long, as the body without the postabdomen; peduncle with the last two joints elongated and subequal; flagellum with 14-24 joints. Epimera not evident in a dorsal view. All the legs very slender. Terminal plate of the opercular valves longer than broad, four-sided, with the posterior and outer angles rounded. The colour, according to M. Lucas, is a fine green, laterally margined and minutely punctulated with reddish. Length nearly $1\frac{1}{3}$ inch (33 millim.), breadth about $\frac{1}{4}$ inch (7 millim.).

This species inhabits the Mediterranean, but its range apparently is not confined to that region.

A male is in the Museum collection, preserved in spirit, from S. Europe (P. B. Webb), and a female, dry, from Tripoli (T. Ritchie).

In the Paris collection I have examined specimens (mostly females) from the Mediterranean (Roux), which are the types of M.-Edwards's description in the 'Hist. Nat. des Crustacés,' and which, like all others I have seen, have a 3-jointed postabdomen; also a male from Nice (M. Risso), a considerable series of both sexes and different sizes from Algeria (M. Lucas), and others without locality. There are also in the collection three specimens in somewhat imperfect condition from Bourbon (M. Breon), which I cannot distinguish specifically from *I. hectica*.

Pallas's types, it may be observed, were from the Atlantic.

IDOTEA LINEARIS.

Oniscus linearis, Linn. *Syst. Nat.* (ed. xii.) p. 1060 (1766); Pennant, *Brit. Zool.* iv. pl. xviii. fig. 2 (1777).

? *Asellus linearis*, Olivier, *Encycl. Méth.* iv. p. 254 (1789).

Idotea tridentata, Latr. *Gen. Crust. et Ins.* i. p. 64 (1806); Lam. *Hist. Anim. sans Vert.* v. p. 160 (1818); Grube, *Abh. schlesisch. Gesellsch. vaterl. Cultur*, p. 125 (1867)?

Idotea hectica, Leach, *Edinb. Encycl.* vii. p. 404, nec Pallas.

Stenosoma lineare, Leach, Linn. *Trans.* xi. p. 366 (1815); Desm. *Consid. Cr.* p. 299, pl. xlvi. fig. 12 (1825); Guérin, *Expl. dans la Morée*, iii. Cr. p. 49 (1832); Brullé in Webb & Berthelot, *Iles Canaries*, Cr. p. 18 (1836-44).

Idotea linearis, Latr. (pt.) *Hist. Nat. Cr. et Ins.* vi. p. 371 (1803); M.-Edw. *Hist. Nat. Cr.* iii. p. 132 (1840); *id. Cr. in Règne Anim. de*

- Cuvier* (éd. 3), pl. lxxix. fig. 3; *Lucas, Anim. artic. in Expl. Sci. Algérie, Cr. i.* p. 61 (1849); *White, List Cr. Brit. Mus.* p. 94 (1847); *id. Cat. Brit. Cr. Brit. Mus.* p. 66 (1850); *id. Pop. Hist. Brit. Crust.* p. 224 (1854); *Burgersdijk, Annotat. Crust. indigenis*, p. 31 (1852); *S. Bate & Westwood, Brit. Sessile-eyed Cr. ii.* p. 388, fig. (1868); *Metzger, Naturh. Gesellsch. zu Hannover*, xx. p. 32 (1871); *Jahresb. der Commiss. zu wiss. Untersuch. des deutschen Meeres in Kiel*, p. 285 (1875); *Parfitt, Rep. Devon Assoc.* p. 255 (1873); *McIntosh, Ann. & Mag. Nat. Hist.* (ser. 4) xiv. p. 274 (1874); *Marine Invert. St. Andrews, Cr.* p. 151 (1875); *Bos, Bijd. Crust. Hedrioph. Nederl.* pp. 35, 71 (1874); *Iloek, Tijd. Nederl. Dierk. Vereenig.* (deel 3), p. 42 (1876); *Sim, List Cr. Aberdeen*, p. 11.
- Idotea diodon*, *Latr. Nouv. Dict. d'Hist. Nat.* xvi. p. 105 (1817).
- Armida bimarginata*, *Risso, Hist. Nat. Eur. mérid.* v. p. 109 (1826).
- Idotea sexlineata*, *Krøyer, Nat. Tidsskr.* (2 R.) ii. p. 88 (1846); *id. Atlas of Cr. in Gaimard's Voy. en Scand.* pl. xxvi. fig. 1; *Meinert, Nat. Tidsskr.* (3 R.) xi. p. 83 (1877), xii. p. 470 (1880).
- Oniscus* (*Idotea*) *entomon*, *Dalyell, Powers of Creator, Cr.* p. 229, pl. cxiii. fig. 10 (1851), *nec Linn.*

The body is narrow oblong, almost linear. The head has its anterior margin strongly excavated and its antero-lateral lobes broadly rounded, and is marked with a sinuated impressed line near the posterior margin. The thoracic segments are narrowest at the posterior margins, and the laterally-projecting epimera give a lobed appearance to the sides of the body. The terminal postabdominal segment is suboblong, but narrowing slightly in its distal portion; the distal extremity is truncated and tridentate, the postero-lateral lobes small, but somewhat more prominent than the median tooth. Eyes of moderate size. Antennules with the basal joint not greatly dilated. Antennæ in the adult very robust, nearly equalling the body in length, with the last two joints of the peduncle subequal, and each nearly or twice as long as the preceding. The epimera are small, and in the second to fourth thoracic segments appear, in a dorsal view, to occupy the *anterior* part of the lateral margin, in the fifth and sixth segments its middle part, and in the last segment its *posterior* part. The postero-lateral angles of the epimera of the sixth and seventh segments are acute. Each of the legs is armed with a strong and arcuate terminal claw, which is completely reflexible against the penultimate joint. The opercular plates present nothing remarkable. The length of the largest male in the collection is about $1\frac{1}{2}$ inch (38 millim.), but average-sized examples do not exceed 1 inch (25 millim.).

This species is marked with olive or purple on a paler ground, the middle line of the back usually remaining pale. The median tooth of the posterior margin of the last segment is often obsolete.

This species occurs in the Mediterranean, on the shores of Great Britain and Ireland, Netherlands, Denmark, &c.; but its range is apparently not confined to the seas of Europe, since there are specimens said to be from Java in the Paris collection, and it is mentioned by M. Brullé in his list of the Crustacea of the Canaries.

There are male, female, and young specimens of this species in the British-Museum collection from Ilfracombe, Devon (Dr. Leach and Col. Montagu), three males from Beerhaven (Sir P. Egerton), three from Northumberland (purchased), one found among shrimps in the London market (F. Moore), and two or three, without special indication of locality, from European seas. All of the above are preserved dry.

Of specimens preserved in spirit, the Museum possesses two males from Ilfracombe (Dr. Leach), one from Ballinskelligs Bay, Ireland (Sir P. Egerton), and several without special indication of locality.

In the Paris collection are many specimens from Algeria (M. Lucas), the specimen (a small one without locality) that served as type to the description of M.-Edwards in the 'Hist. Nat. des Crustacés,' and others said to be from Java (M. Raynaud, Exp. de la Chevrette), with a specimen in fragmentary condition apparently referable to *I. marina*.

S. Bate and Westwood are, I think, in error in referring *Armida viridissima*, Risso, to this species; on the other hand, the description of *A. bimarginata* applies very well to those varieties of it in which the median terminal tooth of the postabdomen is developed.

To this species undoubtedly belongs a specimen in the Linnean Cabinet labelled *linearis*; the quadridentated appearance of the terminal postabdominal segment was caused apparently by the slightly projecting inferior and posterior angles of the opercular valves, which are visible from above in a dorsal view. The habitat "Surinam" is given in the 12th edition of Linneæus's work; but in Linneæus's copy in the possession of the Society the MS. words "*in Oceano Atlantico*" occur, with a line drawn through

them; hence it would seem that Linnæus was in doubt of the true habitat of the types of this species.

Here also, rather than to *I. marina*, must, I think, the *I. tridentata* of Latreille and Lamarck be referred, since the body is described as linear and the antennæ are as long as the body. The *I. tridentata* of Rathke is, however, more probably a variety of *I. marina*.

The *Idotea sexlineata* of Krøyer appears to represent a condition of *I. linearis* in which the antennæ are rather shorter and the median denticle of the posterior margin of the terminal segment is not developed. Specimens from Northumberland in the Museum collection closely resemble Krøyer's figure in these particulars, and in them the longitudinal dark lines on the dorsal surface of the body are clearly discernible.

IDOTEA INDICA. (Plate II. figs. 4 & 5.)

Idotea indica, *M.-Edwards, Hist. Nat. Crust.* iii. p. 131 (1840).

? *Idotea Latreillei*, *Guérin-Méneuv. Icon. Cr. Règne Anim., Crust.* p. 32 (1829-44).

The body is smooth, nearly oblong, and moderately convex. Head with only very faint indications of a transverse groove on its upper surface, with the anterior margin very slightly excavated and the antero-lateral angles broadly rounded and not at all prominent. Thoracic segments (the first excepted) of nearly equal length; the first shorter, with its antero-lateral angles produced and forming broadly rounded lobes which do not reach to the eyes; second to fourth segments with their postero-lateral angles rounded, fifth to seventh with these angles subacute, but not prolonged backward. Postabdomen about as long as the five posterior thoracic segments; the first segment narrowed on the sides; the third (or terminal) segment not twice as long as broad, rather broader in the middle than at either end, with the sides slightly arcuated; the posterior margin very slightly emarginate and nearly straight. Antennules very short, scarcely reaching to the base of the antepenultimate joint of the peduncle of the antennæ, with their basal joints considerably dilated. Antennæ not as long as the head and thorax, with the last two joints of the peduncle nearly equal; flagellum a little shorter than the peduncle and 18-jointed. Legs moderately robust; the last pair with their penultimate joints thickened and considerably elon-

gated. Epimera small, in the second segment occupying, in a lateral view, only the anterior half of the lateral margins, in the second and third segments the middle portion of the lateral margins, in the fifth and sixth segments they reach nearly, and in the seventh segment quite, to the postero-lateral angles. Distal plates of the opeculum four-sided, with their posterior margins truncated. Length about $1\frac{7}{8}$ inch (40 millim.).

Hab. Malabar (M. Dussumier).

The description is taken from the type in the collection of the Paris Museum, which is an adult male, and is the only specimen I have seen. In it the flagellum of one antenna is broken.

The *Idotea Latreillei* of Guérin-Méneville, from the Cape of Good Hope, is apparently distinguished merely by the longer flagellum of the antennæ (which is longer than the peduncle); the legs are described as slender, and there is a deep longitudinal median groove on the upper surface of the terminal postabdominal segment. It may be distinct; but I am inclined to regard this species as identical with *I. indica*. *I. indica* is distinguished from *I. linearis* by its much broader body, non-projecting epimera, and much shorter antennæ.

III. *Postabdomen composed of two distinct segments (visible in a dorsal view).*

The species of this section of the genus may be distinguished as follows:—

* *Terminal segment emarginate at its distal end.*

Oblong-ovate: epimera well developed, in the sixth thoracic segment occupying the whole of the lateral margins of the segment.

1. *I. unguolata* (Pallas).

Slender, with subparallel sides: epimera very narrow, of the sixth segment occupying a very small portion of the thoracic segment.

2. *I. elongata*, Miers.

Slender: epimera forming with the laterally produced margins of the thoracic segments distinct rounded lobes.

3. *I. lobata*, White (*ined.*), Miers.

** *Terminal segment subtriangulate at its distal end.*

Suboblong: epimera narrow.

4. *I. Peronii*, M.-Edwards.

IDOTEA UNGULATA.

- Oniscus ungulatus*, Pallas, *Spicil. Zool.* ix. p. 62, pl. iv. fig. 11 (1772).
Idotea ungulata, Lam. *Hist. Anim. sans Vert.* v. p. 160 (1818).
Idotea Lalandii, M.-Edwards, *Hist. Nat. Crust.* iii. p. 132, pl. xxxi. fig. 7 (1840); Krauss, *Südafrik. Crust.* p. 61 (1843).
Idotea affinis, M.-Edw. *Hist. Nat. Cr.* iii. p. 133 (1840); Krauss, *Südafrik. Crust.* p. 61 (1843); White, *List Cr. Brit. Mus.* p. 95 (1847); Heller, *Cr. in Reise der Novara*, p. 130 (1865); Miers, *Catalogue of New-Zealand Crustacea*, p. 93 (1876); Thomson, *Trans. New-Zeal. Inst.* xi. p. 232 (1879).
Idotea Edwardsii, Guérin-Méneville, *Icon. Cr. R. Anim.*, texte Cr. p. 33 (1829-44).
Idotea nitida, Heller, *Verhandl. zool.-bot. Vereins Wien*, p. 497 (1861); *id. Cr. in Reise der Novara*, p. 131, pl. xii. fig. 1 (1865).

Body oblong, moderately convex, and nearly smooth. Head with the frontal margin very slightly concave, but with a slight depression in the middle; antero-lateral angles usually but little prominent, smooth above, or with faint indications of an impressed curved line near the posterior margin. Segments of the thorax smooth; the first the shortest, its antero-lateral processes obtuse; the postero-lateral angles of the first to third segments rounded, of the fourth to seventh segments rectangular or acute. Postabdomen somewhat depressed towards its distal extremity, smooth, with lateral sutures indicative of two coalescent segments; terminal segment with the lateral margins straight to within a short distance of the postero-lateral angles, which are either obtuse or acute; distal end emarginate. Eyes small, black. Antennules not reaching to the distal end of the penultimate joint of the peduncle of the antennæ. Antennæ when retracted not reaching to the posterior margin of the fourth thoracic segment, and often much shorter; last two joints of the peduncle short and subequal; flagellum longer than the peduncle, with 12 to 28 joints. Epimera rather narrow, in the second and third thoracic segments scarcely occupying more than half the length of the lateral margins, in the fourth to seventh segments occupying their whole length; only the last two epimera on each side have their postero-lateral angles acute. The legs are robust; the fourth to seventh pairs of legs have their posterior and outer angles of the merus and ischium produced, and in adult examples spiniform. The posterior plates of the opercular valves are buadrate and nearly square. The length of the largest example

in the Museum collection exceeds $2\frac{1}{2}$ inches (58 millim.), but average-sized examples measure about $1\frac{3}{4}$ inch (45 millim.).

This species appears to be widely distributed throughout the Antarctic or, rather, Austral circumpolar region. It occurs also in the Indian Ocean (Pallas), Southern Australia, and on the Eastern coasts of S. America northward to Rio de Janeiro, and on the Western coasts as far north as Talcahuano (Chili).

The above description is drawn up from specimens, formerly designated *I. affinis*, in the British Museum.

There are examples of both sexes, and preserved dry, in the collection without definite locality, designated by Leach *I. elevata*; others from Australia (Earl of Derby); some young examples from S. Australia (purchased), a specimen from Tasmania, a male and female from Flinders Island (Surg. Rayner, H.M.S. 'Herald'); two males and a female from the Auckland Islands (Admiralty), designated by White *I. longicornis*; a male of large size and two females from New Zealand (purchased); two smaller examples from Collingwood, Nelson County, New Zealand (H. Drew); a male of large size, said to come from the Cape of Good Hope. All of the above preserved dry. Also two males, preserved in spirit, from the Falkland Islands (Admiralty).

In the Paris collection I have examined the types of *I. Lalandii* from the Cape of Good Hope (M. de Lalande), which are of very large size ($2\frac{1}{3}$ inches, 59 millim.), having the epimera as described above, and the postero-lateral angles of the fourth to seventh thoracic segments slightly produced and acute. Also the types of *I. affinis*, M.-Edwards, from Rio de Janeiro (M. Freycinet), in which the antennæ are now imperfect. These specimens are of rather small size; but the differences between them and *I. Lalandii* are not greater than I have observed between examples from one and the same locality of this species, and I have only marked the citation with doubt on account of the wide-removed habitat. There is, however, a specimen of larger size from South America (M. A. Edwards). Specimens are in the collection, also, from Talcahuano, Chili (M. Jaquinot), one from Auckland, several from New Zealand (Exp. de la Zélée, Quoy and Gaimard, M. Lavoux), and others without locality.

In the large series that has been under my observation I have noticed considerable variation in the length of the flagella of the antennæ, the robustness of the legs, and the depth of the posterior notch of the terminal segment and the acuteness of its postero-

lateral angles. In the very large specimens from the Cape of Good Hope the antennæ are relatively shorter, the legs more robust, and the posterior notch shallower, but this appears merely to be due to the greater size and age of the specimens. In the smaller specimens from the Cape these characters disappear.

In a great number of New-Zealand specimens examined by Mr. Thomson that naturalist found the length to vary from 1 to over $2\frac{1}{2}$ inches (35 to 65 millim.), and the number of joints in the antennal flagellum from 16 to 32.

The *Oniscus unguulatus* of Pallas has generally been considered to be synonymous with *I. linearis*, but the description and figure agree far better with *Idotea Lalandii*. Pallas says that the head is truncated anteriorly, the three anterior thoracic segments have their postero-lateral angles rounded, the posterior segments are subimbricated, with acute angles. The epimera of the second and third segments do not reach to the posterior margin of the segment. There is a single distinct postabdominal segment besides the terminal segment, which is marked on each side with a double stria (or suture), and is excised and bidentate at its posterior margin (*i. e.* with prominent postero-lateral angles). Antennæ of moderate size, 18-jointed; in the figure they are represented as very short, not reaching beyond the posterior margin of the second thoracic segment, and the joints of the peduncle short, scarcely distinguishable from the flagellum. Pallas gives the Indian Ocean as the locality of his specimens.

IDOTEÆ ELONGATA.

Idotea elongata, White, *List Crust. Brit. Mus.* p. 95 (1847), sine desc.; Miers, *Ann & Mag. Nat. Hist.* (ser. 4) xvii. p. 225 (1876); *Catalogue of New-Zeal. Crust.* p. 93, pl. ii. fig. 3 (1876).

Body elongate, almost linear, smooth, with the dorsal surface very convex, so that the animal appears almost cylindrical in a dorsal view. Head with the anterior margin scarcely excavated, but with a slight depression in the middle between the antennules; antero-lateral angles not prominent. Segments of the thorax (in the adult male) usually longer than broad, first segment with the antero-lateral lobes prominent and obliquely truncated. Postabdomen about equalling the $3\frac{1}{2}$ posterior thoracic segments in length, having usually indications of a lateral suture on each side at some distance from the base of the terminal segment, which is rather depressed above, with subparallel sides,

rounded postero-lateral lobes, and a moderately deep rounded notch at its distal end. Eyes small. Antennules scarcely reaching to the distal end of the antepenultimate joint of the antennæ, which have a short peduncle, the last two joints of which are subequal and each but little longer than the antepenultimate joint; flagellum 18-22-jointed; when retracted the antennæ do not reach beyond the posterior margin of the fourth thoracic segment. Legs very slender. Epimera scarcely visible in a dorsal view; in a lateral view they are very narrow, linear, and the last pair only reach to the postero-lateral angles of the segment with which they are articulated. Terminal plates of the opercular valves somewhat longer than broad, four-sided, with the distal ends truncated or very slightly emarginated. Length of a full-sized male about 2 inches (50 millim.), breadth about $\frac{1}{4}$ inch (7 millim.).

Specimens, apparently males, are in the Museum collection from the Auckland Islands (Antarctic Exped.), preserved dry; and a good series of both sexes, preserved in spirit, from the Falkland Islands (Antarctic Exped.).

When I drew up the original description I had not observed that the Falkland-Island examples were of the same species, and basing my diagnosis on the dried examples only, I fell into one or two inaccuracies: thus the head is not generally coalescent with the first thoracic segment, and the thoracic segments not always longer than broad. In females with fully-developed brood-pouches, the second to fourth thoracic segments appear laterally dilated in a dorsal view.

In the Paris collection there are six specimens from Auckland.

IDOTEA PERONII. (Plate II. figs. 6 & 7.)

Idotea Peronii, *M.-Edw. Hist. Nat. Cr.* iii. p. 133 (1840).

Idotea distincta, *Guérin-Méneville, Icon. Règne Anim., Cr.* p. 33 (1829-44).

Body narrow-oblong rather than oval, not carinated, nearly smooth. Head emarginate anteriorly, the middle of the notch straight; the antero-lateral angles rather prominent and rounded. First thoracic segment with the antero-lateral lobes rather broad, and not reaching nearly to the eyes. Postabdomen as long as the four or five posterior thoracic segments; terminal segment with two small sutures on each side near the base (indicative of coalescent segments) and with subparallel sides, distal end usually broadly triangulate, and apex subacute. Eyes of mode-

rate size. Antennules scarcely reaching to the base of the antepenultimate joint of the peduncle of the antennæ, with their basal joints considerably dilated. Antennæ with the joints of the peduncle short, the last two subequal, and each but little longer than the antepenultimate joint; flagellum 16-21-jointed and longer than the peduncle. The epimera are narrow, and in the second, third, and fourth thoracic segments scarcely occupy more than half the length of the lateral margins; in the fifth segment they reach nearly, and in the sixth and seventh segments quite, to the postero-lateral angles, and in these segments are of a more or less triangulate shape. The legs are very slender. The terminal plates of the opercular valves are three-sided, with their outer margins curving to the distal extremity, which is subacute or blunt. Length of the largest male about $1\frac{5}{8}$ inch (48 millim.), breadth nearly $\frac{5}{12}$ inch (10 millim.); but most of the specimens are much smaller.

In the British-Museum collection are specimens:—from York Peninsula, Australia, a female, preserved dry (G. F. Angas); Tasmania, a male, dry (Ronald Gunn); and a small example, also in a dry state, from Flinders Island, Bass's Straits (Surgeon Rayner, H.M.S. 'Herald'); also a good series of males and females from Flinders Island, preserved in spirit (Dr. Milligan).

The examination of the type of M.-Edwards's *Idotea Peronii* (a male, from King's Island, M. Péron), in the collection of the Paris Museum, seems to show that M. Guérin's *Idotea distincta* cannot be specifically distinct. In M.-Edwards's type there are in reality *two* lateral sutures (not a single one as stated) on the sides of the terminal segment near its base. The only distinctive character is the more rounded apex of the terminal segment in *I. Peronii*, which, in this instance, is probably due to the contraction of the specimen (which was formerly in a dry state), and it is not, moreover, a character of much importance. M. Guérin's types were from the Cape of Good Hope. In the Paris collection are a considerable series from Melbourne.

The description was taken from specimens in the British Museum, with which M. Milne-Edwards's type, now somewhat shrivelled and with imperfect antennæ, has been compared. In Australian specimens the apex of the terminal segment is often just of the form described by Guérin-Méneville in *I. distincta*.

In a small example from Flinders Island in the British Museum the head is less distinctly emarginated, the terminal segment is

more acuminate at its distal end, and the posterior epimera are small.

This species in external form nearly resembles *I. stricta*, Dana, with which I should have considered it identical, but for the bi-articulate postabdomen, the terminal segment of which is marked near its base with two sutures. The antennal flagellum is more numerously jointed.

The description is taken from examples in the Museum collection, which I have compared with the Paris type. They scarcely differ from the description of Guérin-Méneville, except in the longer antennæ, whose flagellum is nearly always longer than the peduncle.

In the brood-pouches of some of the females from Flinders Island are numerous young examples, about $\frac{1}{8}$ inch (4 millim.) in length.

IDOTEA LOBATA. (Plate II. figs. 8 & 9.)

Idotea lobata, White, *List Cr. Brit. Mus.* p. 96 (1847), *descript. nullâ.*

In this remarkable species the body is elongated and moderately convex, the segments of the thorax are laterally produced, and with the greatly developed epimera form lateral prolongations that are perfectly distinct from one another even at their bases, and are more or less rounded at their apices. The head has its frontal margin nearly straight, and its antero-lateral angles are not prominent. The thoracic segments are short and nearly smooth above. The postabdomen about equals the four posterior thoracic segments in length; the terminal segment has straight and subparallel sides, and is emarginate at its distal extremity, with the postero-lateral angles rounded. Eyes large. The antennules apparently reach almost to the extremity of the penultimate peduncular joint of the antennæ, and have their basal joints moderately dilated. Antennæ short, when retracted not reaching beyond the posterior margin of the fourth thoracic segment, with the last two joints of the peduncle subequal, short, but longer than the preceding; flagellum with about 10 joints. The epimera, in a dorsal view, are large and occupy the whole of the lateral margins of the produced thoracic segments. Legs slender and nearly naked. Terminal plates of the opercular valves four-sided, but little longer than broad, with the distal ends truncated. Length rather more than $\frac{1}{3}$ inch (10 millim.), breadth nearly $\frac{1}{6}$ inch (4 millim.).

The single example, in dry state, in the collection is unfortunately without any definite locality.

In its widely-separated and laterally-projecting epimera it is very unlike any other species of the genus with which I am acquainted. M. Lucas, indeed, in his figure of *I. algirica*, exhibits a somewhat similar structure of the epimera, but the figure is probably exaggerated. *I. algirica*, moreover, has a 3-jointed postabdomen and a truncated terminal segment; and I have considered it synonymous with *I. metallica* on the authority of specimens in the Paris collection.

IV. *Postabdomen with all the segments (in a dorsal view) consolidated and forming a single piece.* (Leptosoma, Risso; Crabyzos, S. Bate.)

The species of this section may be distinguished as follows:—

a. *Terminal segment not emarginate at its distal end.*

Suboblong, with straight subparallel sides; terminal segment subacute: epimera of the second to fourth segments not distinguishable; head with a dorsal tubercle.

1. *I. carinata*, Lucas.

Suboblong; sides and thoracic segments straight; terminal segment subtriangulate at distal end: epimera all distinct; head without a dorsal tubercle.

2. *I. stricta*, Dana.

Narrow; lateral margins of the thoracic segments angulated; terminal segment acute or subacute: epimera very small; head without a dorsal tubercle.

3. *I. acuminata* (Leach).

Very narrow and elongated; sides of thoracic segments straight; terminal segment produced and acuminate: epimera very small; head without a dorsal tubercle.

4. *I. longicaudata* (S. Bate).

b. *Terminal segment emarginate at its distal end.*

Oblong-ovate: epimera distinct and well developed; head with a dorsal tubercle.

5. *I. Lichtensteini*, Krauss.

IDOTEA CARINATA.

Idotea carinata, Lucas, *Anim. artic. in Expl. Sci. Algérie*, i. Cr. p. 60, pl. vi. fig. 1 (1849).

Body oblong-oval, moderately elongated, strongly carinated in the middle dorsal line. Head with the anterior margin distinctly excavated, the antero-lateral angles nearly right angles; the upper surface armed with a strong tubercle, which is more or less di-

stinctly bilobed at its apex. Thoracic segments nearly smooth above, the first shortest, with its anterior margin deeply excavated and the broadly-rounded antero-lateral lobes reaching to the eyes; postero-lateral angles of all the segments subacute. Postabdomen strongly carinated in the middle line; the keel reaching quite to the posterior margin, uniarticulate, with three very distinct lateral fissures (indicative of coalescent segments), with the sides slightly convergent to the distal extremity, which rounds off to a small median cusp or point. Antennules not reaching to the distal end of the antepenultimate joint of the antennæ, which do not usually exceed half the body in length; peduncle with the last two joints subequal and but little longer than the preceding; flagellum shorter than the peduncle, and 4- to 6-jointed. The epimera of the three posterior thoracic segments only are visible in a dorsal view, and in these they are rather broad, with the postero-lateral angles not acute, and are not prolonged beyond the posterior margin of the segments. Legs very slender, almost filiform. Distal plate of the opercular valves almost triangulate, with the apex subacute. The colour (according to M. Lucas) is deep green; all the thoracic segments with their posterior and lateral margins margined with yellow; antennæ yellowish; antennules greenish yellow. Length $\frac{5}{6}$ inch (21 millim.), breadth nearly $\frac{1}{4}$ inch (6 millim.).

I. carinata does not, so far as I am aware, extend beyond the shores of the Mediterranean.

The description is taken from specimens in the Paris collection from Algeria (Lucas), one of which has been retained for the British Museum, but the colour and measurements are from M. Lucas's work.

This species is very distinct from most of the genus, and in several points approaches certain species of the genus *Edotia*, from which it is distinguished by the distinct epimera of the posterior thoracic segments and subparallel sides of the body. There is no distinct oblique line on the basal plates of the operculum.

M. Lucas mentions the occurrence of this species at Bona and Oran.

IDOTEA ACUMINATA.

Stenosoma acuminatum, Leach, *Edinb. Encycl.* vii. p. 433; *id. Trans. Linn. Soc.* xi. p. 366 (1815).

- Idotea lanciformis*, *Risso, Cr. de Nice*, p. 136, pl. iii. fig. 11 (1816).
Leptosoma lanceolata, *Risso, Hist. Nat. Eur. mérid.* v. p. 107 (1826).
Leptosoma appendiculata, *Risso, Hist. Nat. Eur. mérid.* v. p. 107, pl. v. fig. 23 (1826); *Hope, Cat. Cr. Ital.* p. 26 (1851).
Leptosoma capito, *Rathke, Beitr. in Mém. Sav. étrang. St. Pétersb.* iii. p. 384, pl. vi. figs. 7-9 (1837).
Idotea appendiculata, *M.-Edw. Hist. Nat. Cr.* iii. p. 135 (1840); *White, List Cr. Brit. Mus.* p. 95 (1847); *Cat. Brit. Cr. B. M.* p. 66 (1850); *Pop. Hist. Brit. Cr.* p. 224, pl. xii. fig. 3 (1857); *Lucas, Anim. artic. in Expl. Sci. Algérie*, p. 62 (1849); *Heller, Verh. zool.-bot. Gesellsch. Wien*, xvi. p. 731 (1866); *S. Bate & Westwood, Brit. Sessile-eyed Crust.* ii. p. 396, fig. (1868); *Parfitt, Rep. Devon Assoc.* vi. p. 255 (1873); *Stalio, Att. Istit. Venet.* (ser. 5) iii. p. 1354 (1876-77).
Idotea acuminata, *White, List Cr. Brit. Mus.* p. 95 (1847); *Cat. Brit. Crust. B. M.* p. 66 (1850); *Pop. Hist. Brit. Crust.* p. 224 (1857); *S. Bate & Westwood, Brit. Sessile-eyed Crust.* ii. p. 394, fig. (1868); *Parfitt, Rep. Devon Assoc.* vi. p. 255 (1873).
Idotea angustata, *Lucas, Anim. artic. in Expl. Sci. Algérie*, p. 63, pl. v. fig. 3 (1849); *nec Nicolet.*
Idotea capito, *Lucas, Anim. artic. in Expl. Sci. Algérie, Cr.* p. 63 (1849); *Heller, Verh. zool.-bot. Gesellsch. Wien*, xvi. p. 730 (1866); *Czerniavsky, Mat. Zoograph. ponticam*, pp. 84, 130 (1868); *Stalio, Att. Istit. Venet.* (ser. 5) iii. p. 1355 (1876-77).
Leptosoma lanceforme, *Hope, Cat. Cr. Ital.* p. 27 (1851).

Body narrow, elongated, moderately convex, with indications of a longitudinal median dorsal carina. Head with its anterior margin somewhat excavated, and its antero-lateral angles rather prominent. First four segments of the thorax each widest in the middle, and with their lateral margins (in a dorsal view) more or less angulated; the posterior segments of the thorax are widest at or near their postero-lateral angles. Postabdomen ovate-lanceolate, with the lateral margins at first straight and then curving regularly to the distal extremity, which is subacute or acute, or even acuminated, and with more or less distinct traces of lateral sutures near its base, indicative of two coalescent segments. Eyes small, placed in the middle of the lateral margins. Antennules do not reach the extremity of the antepenultimate joint of the peduncle of the antennæ, with their basal joints moderately dilated. Antennæ reaching sometimes to the posterior margin of the sixth thoracic segment; the last two joints of the peduncle slender, subequal, and each longer than the preceding; flagellum about 19-jointed and longer than the peduncle. Legs

very slender, subequal. The epimera (in a dorsal view) are very small, and in the second to fourth segments occupy the middle of the lateral margins; in the fifth and sixth segments they are placed near to, and in the seventh segment quite at the postero-lateral angle of the segment; in the last two segments they are of nearly triangular form. The terminal plates of the operculum are considerably longer than broad, and rounded at their distal ends. Length of the largest example in the Museum collection about 1 inch (25 millim.), breadth rather less than $\frac{1}{4}$ inch (5 millim.).

This is a very variable species, and I have been obliged to unite under one name several types that have usually been considered distinct.

It occurs on the shores of the Mediterranean and Adriatic, in the Black Sea, on the south British coasts, and northward apparently as far as the island of Cumbray on the Clyde.

Dr. Leach's designation of *I. acuminata* may apply to what may be considered the typical form of this species, in which the body is less distinctly carinated, the epimera less distinctly angulated, and the terminal segment lanceolate, with the sides rounding off to the distal extremity, which is acute or subacute, but not produced and acuminated.

Besides Leach's typical specimen (which is in very bad condition), there is but a single specimen, from Tripoli, in the British-Museum collection presenting these characters.

In the Paris collection I have examined five examples from Nice (types of Milne-Edwards's description of *I. appendiculata*, Risso); also a good series from Algeria without special locality (M. Lucas), designated *I. angustata*; and three from the neighbourhood of Constantine (M. Lucas), labelled *I. capito*, Rathke.

IDOTEA ACUMINATA, var. *LANCIFORMIS*, *Risso* ?

This variety nearly resembles the typical *acuminata*, but the terminal segment is angulated, not rounded on the sides towards the distal extremity, which thus appears more or less triangulate.

Two specimens from Marseilles and one from Dalmatia (Dr. Heckel), in the British-Museum collection, belong here.

IDOTEA ACUMINATA, var. *APPENDICULATA*, *Risso*.

Under this designation may be grouped the specimens having the body more depressed, flattened on the sides, but strongly

longitudinally carinated in the middle line; the epimera very prominently and distinctly angulated, and the terminal segment rounded on the sides, but produced and acuminate at the distal end.

There are in the British-Museum collection two specimens from Tripoli.

In the Paris collection I have examined five examples from Bona and one from near La Calle (M. Lucas); also one found amid Algerian specimens of *I. hectica* (Lucas), in which the tip of the terminal segment has been broken off.

Risso apparently figures a specimen of this variety under the name of *appendiculata*; therefore his name is retained for it.

IDOTEA ACUMINATA, var. LANCIFER, *Leach (ined.)*.

This variety is distinguished by the form of the terminal post-abdominal segment, which is widest at a point distant about two thirds from the base, after which it is suddenly contracted, the terminal portion or cusp being narrow-linear and produced. The body is carinated, as in var. *appendiculata*, but the epimera are less distinctly angulated.

The only specimens I have seen presenting these characters are two males and a younger example from Devon, Sidmouth (Dr. Leach), designated *I. lancifer* by Leach and *I. appendiculata* by White, and a female from Ilfracombe (Mr. Gosse) in the British Museum; but a considerable approach to them exists in the variety designated *I. lanciformis* by Risso.

This variety is figured by White, S. Bate and Westwood (*loc. cit.*) as *Idotea appendiculata*.

IDOTEA STRICTA.

Idotea stricta, Dana, *U.S. Expl. Exp.* xiv. Cr. ii. p. 704, pl. xlvi. fig. 7 (1853); S. Bate, in *Lord's Naturalist in Brit. Columbia*, ii. p. 282 (1866)?

This species is described by Prof. Dana as narrow, with the front excavate; head a little transverse. The surface is not distinctly granulate. Postabdomen uniarticulate, longer than half the cephalothorax, narrow-oblong (length more than twice the breadth), with a suture on each side near the base; lateral margins a little excavate or concave, extremely triangulate or subacute. Antennules scarcely reaching to the penultimate joint of

the peduncle of the antennæ, which are about half as long as the body; flagellum shorter than the peduncle, 10-jointed, naked. Epimera occupying only part of the margin of each thoracic segment. Legs sparingly hirsute below. Length 0·86 inch, breadth 0·17, ratio 5 : 1.

New South Wales, Australia (Dana).

Were it not for the uniarticulate postabdomen, I should consider it identical with *I. Peronii*.

Mr. S. Bate refers, without any description, specimens from Esquimalt Harbour, British Columbia, to this species; it is far more probable that they belong to *Idotea ochotensis* or *I. Whitei*.

IDOTEA LONGICAUDATA.

Crabzys longicaudatus, *S. Bate, Proc. Zool. Soc.* p. 504, pl. xli. fig. 7 (1863).

The body is elongated and slender, smooth, with the sides nearly parallel. The head is partially coalescent with the first thoracic segment, and about equals it in length; the dorsal surface of the thoracic segments is nearly flat, while the margins with the epimera stand nearly perpendicular to them; the last two segments are rather shorter than the preceding. The head has its anterior margin excavated; but the median part behind the antennules is straight. The postabdomen is as broad at base as the posterior thoracic segments, with the sides at first nearly parallel and afterwards divergent; the distal extremity is acuminate, terminating in a long cusp or point. Eyes small, round, placed near the antero-lateral angles. Antennules slender, with the basal joints not dilated. Antennæ nearly four times as long as the antennules, but not reaching, when retracted, to the posterior margin of the third thoracic segment; the first two of the peduncular joints are very short, the last three elongated and of nearly equal length; flagellum shorter than the peduncle, and 12-14-jointed. The legs are slender, feeble, and nearly naked, but the first pair are more elongated and robust than the rest; the epimera or coxal joints are quite small, and, in a lateral view, occupy only a very small part of the lateral margins; the dactyli of all are furnished with a small accessory claw. The opercular valves do not reach beyond the beginning of the long terminal cusp of the postabdomen; their terminal plate is longer than broad, suboblong. Colour is said to have been apple-green.

darker along the line of the alimentary canal, with numerous minute spots over the surface generally. Length of the larger example about $1\frac{2}{3}$ inch (43 mm.).

Loc. Gulf of St. Vincent, S. Australia (G. F. Angas).

Two specimens are in the British-Museum collection: the larger is a female, with ova; the smaller, which is $1\frac{1}{6}$ inch in length (30 mm.), is a male. In the figure cited the antennæ are incorrectly drawn, and the anterior legs are too much enlarged.

This remarkable species cannot, I think, be generically separated from *Idotea*; in its general form and the very small development of the coxal joints or epimera it is more nearly allied to *I. elongata* than to any of the species with uniaarticulate post-abdomen. In both examples the suture separating the head from the first thoracic segment is distinct at the sides; in the smaller it is even faintly traceable across the dorsal surface.

IDOTEA LICHTENSTEINII.

Idotea Lichtensteinii, Krauss, *Die Südafrik. Crust.* p. 62, pl. iv. fig. 4 (1843).

In this species the body is somewhat elongated, finely granulated above, carinated longitudinally. The head is firmly encased in the first thoracic segment, has its anterior margin three-toothed, and has a somewhat deflexed blunt lobe on its upper surface, which projects in the middle beyond the frontal margin. The postabdomen is posteriorly somewhat conically contracted, and is as long as the thorax is broad; it has three sutures on each side near its base, and its posterior margin is notched, with the postero-lateral angles rounded. The antennules reach to the end of the penultimate joint of the peduncle of the antennæ, which reach, when retracted, to the middle of the third thoracic segment. Legs slender, compressed; the first pair with the penultimate and antepenultimate joints somewhat hairy; the rest smooth, with a feeble tooth on the under edge of the penultimate joint. The epimera reach to the posterior margins of the segments, to which they are articulated; the three anterior are narrow, and the three posterior broad and truncated. Length rather more than 1 inch English (about 26 mm.), breadth nearly 7 lines (14 mm.).

Capé of Good Hope; Table Bay (in algæ).

I have seen no specimens of this species, which in many of its

characters approaches *Edotia*, from which it is distinguished by the distinct epimera.

EDOTIA.

Edotia, Guérin-Méneville, *Icon. Règne Animal, Cr.* p. 34 (1829-44);
Dana, *Amer. Journ. of Sci. & Arts*, (ser. 2) xiv. p. 300 (1852); *id.*
U.S. Expl. Exp. xiv. (Cr. 2), p. 697 (1853).

Anisonotus, White, *List Crust. Brit. Mus.* p. 97 (1847), *descript.*
nullâ.

Desmarestia, Gay, *Hist. de Chile, Zool.* iii. *Cr.* p. 284 (1849); *Dana*,
t. c. p. 1595 (1853).

? *Epelys*, *Dana*, *Amer. Journ. of Sci. & Arts*, (ser. 2) viii. p. 426 (1849),
 xiv. p. 300 (1849); *id.* ? *U.S. Expl. Exp.* xiv. (Cr. 2) pp. 697, 705
 (1853); ? *Harger*, *Isopoda in Rep. U.S. Fish Comm.* pt. vi. p. 357
 (1880).

Synidotea, *Harger*, *Amer. Journ. of Sci. & Arts*, (ser. 3) xv. p. 374
 (1878); *id.* *Isopoda in Rep. U.S. Fish Comm.* pt. v. p. 350 (1880).

Body rather convex, usually of a firmer and more solid structure than in *Idotea*, more or less ovate, with the sides narrowing rapidly from the third or fourth thoracic segment to the distal end of the postabdomen. Postabdomen uniarticulate or biarticulate. Antennules slender, longer or shorter than the head. Antennæ either short, with an obsolete or with a minute rudimentary flagellum, or well developed, with the flagellum multiarticulate. Epimera not distinct, and not evident in a dorsal view, *i. e.* not distinctly articulated with the thorax. Legs moderately robust; the three anterior pairs with the penultimate joints or palms not greatly dilated; dactyli strong. Operculum with the basal or proximal plates having their outer surface crossed by an oblique raised line (in the species I have examined).

§ *Antennæ well developed, with the flagellum composed of several joints. Postabdomen uniarticulate.* (*Synidotea.*)

The only distinction that can be cited to separate the species of *Synidotea* from *Edotia*, viz. the long antennæ with more numerous articulated flagellum, is, I think, scarcely of generic importance, since the length of the flagellum is subject to considerable variation, even in different individuals of a single species. In *Edotia (Synidotea) nodulosa* the flagellum is only about 9-jointed, the last two joints being very minute.

The species of this section of the genus may be distinguished as follows :—

a. *Terminal segment emarginate at its distal end.*

Head with a median notch in its anterior margin; terminal plates of the valves of the operculum triangulate, acute at apex.

1. *E. bicuspidata* (Owen).

Head with the anterior margin entire; terminal plates of the valves of the operculum four-sided, truncated at apex.

2. *E. hirtipes* (M.-Edw.).

b. *Terminal segment not emarginate at its distal end.*

Head with its anterior margin notched; terminal plates of the opercular valves triangulate.

3. *E. nodulosa* (Kröyer).

—**EDOTIA BICUSPIDA.** *Synidotea bicuspidata* (Owen) Benedict

Idotea bicuspidata, Owen, *Crust. in Zool. Capt. Beechey's Voyage*, p. 92, pl. xxvii. fig. 6 (1839); *Streets & Kingsley, Proc. Essex Instit.* ix. p. 103 (1877); *Miers, Crustacea in Markham's Polar Reconnaissance* p. 342 (1881).

Idotea consolidata, Stimpson, *Pr. Cal. Acad. Nat. Sci.* i. p. 89; *id. Boston Journ. Nat. Hist.* vi. p. 503 (1853).

Idotea marmorata, Packard, *Mem. Boston Soc. Nat. Hist.* i. (pt. 2) p. 296, pl. viii. fig. 6 (1867); *Whiteaves, Canad. Nat.* p. 262 (1875).

? *Idotea rugulosa*, Buchholz, *Cr. in Zweite deutsche Nordpolarf.* ii. p. 285, note (1874).

Idotea pulchra, Lockington, *Pr. Cal. Acad. Sci.* vii. (pt. i.) p. 45 (1877).

Synidotea bicuspidata, Harger, *Pr. U.S. Nat. Mus.* ii. p. 160 (1879); *id. Isopoda in Rep. U.S. Fish Commission*, pt. vi. p. 352 (1880).

Synidotea incisa, G. O. Sars, *Arch. f. Math. og Naturvidenskab.* iv. p. 433 (1880).

Body ovate; in the largest examples rather depressed. Head transverse; anterior margin nearly straight, with a small median notch; its antero-lateral angles prominent and nearly right angles; its upper surface very uneven, the inequalities defined by strongly marked depressions. Thoracic segments short, of nearly equal length in the middle line, where they are marked above with two short transverse raised lines, and rugose on the sides midway between the median line and lateral margins; first three or four segments with the antero-lateral and postero-lateral angles broadly rounded; the following segments with the postero-lateral angles nearly right angles. Postabdomen in the adult about equalling the four posterior thoracic segments in length, and

about as long as broad at base, nearly smooth, moderately convex, with the lateral margins converging regularly to the distal extremity, which has a small shallow rounded notch, and with a single lateral suture on each side at base, indicative of a coalescent segment. Eyes large, prominent. Antennules in the adult scarcely reaching beyond the base of the penultimate peduncular joint of the antennæ, somewhat remote from one another, with their basal joints very small. Antennæ about half as long as the body; the last peduncular joint longer than the preceding; flagellum 14-17-jointed. Legs moderately robust, rather thinly pubescent; claws slender. Terminal plates of the operculum triangulate, and but little longer than broad at base. Length of the largest male about 1 inch (25 mm.), breadth nearly $\frac{1}{2}$ inch (12 mm.).

E. bicuspidata is a widely distributed inhabitant of the boreal and Arctic regions; its ascertained range is from Spitzbergen to Behring's Straits, and southward along the eastern coast of North America to the Gulf of St. Lawrence.

There is in the Museum collection a dried example without locality (Sir J. Richardson); six specimens in spirits, males and young, from the Matyushin Shar (Capt. A. H. Markham); and two adult females and two young in spirit without locality (Haslar Hospital).

Capt. Markham's specimens still present traces of the beautiful coloration mentioned by Mr. Lockington, having purplish cloudings on a lighter ground.

The identification of *Idotea pulchra* with *E. bicuspidata* is made by Mr. Lockington himself in a MS. marginal note of the copy of his paper communicated to the author.

I can see no sufficient reason for separating either the *Idotea rugulosa*, Buchholz, or the *Synidotea incisa* of Sars, both from Spitzbergen, from this species.

~~EDOTIA NODULOSA.~~

Synidotea nodulosa Hoyer

Idotea nodulosa, Krøyer, *Naturhist. Tidsskr.* (2 R.) ii. p. 100 (1846); *id.*? *Atlas of Crust. in Voy. en Scand.* pl. xxvi. fig. 2; Reinhardt, *Fortegnelse over Grönlands Krebsdyr*, p. 34 (1857); Lütken, *List of Crust. of Greenland in Arctic Manual*, p. 150 (1875).

Synidotea nodulosa, Harger, *Am. Journ. of Sci. & Arts*, (ser. 3) xv. p. 374 (1878); *id.* *Pr. U.S. Nat. Mus.* ii. p. 160 (1879); *id.* *Rep. Geol. Survey Canada*, p. 218 B (1878-79); *id.* *Isopoda in Rep. U.S. Fish Commission*, part vi. p. 351, pl. vi. figs. 33-35 (1880).

This species is closely allied to the foregoing, but is distinguished by its more convex and proportionately narrower body, and the form of the terminal segment, the distal end of which is obtusely pointed, not emarginate and bicuspid. The head is tuberculated above, the inequalities separated by deep depressions. The thoracic segments are convex or tuberculated above in the middle line, and very rugose on each side at some distance from the lateral margins. The postabdomen is longer than broad at base, and in the Museum specimen longer than the last four segments of the thorax, convex above, and rather contracted toward the distal extremity, with the lateral margins somewhat sinuated; the apex slightly produced and rounded and entire. Antennæ with the flagellum about 9-jointed. The terminal plates of the opercular valves are longer and more narrowed at the distal end (in the Museum example). Length rather more than $\frac{5}{8}$ inch (22 mm.), breadth nearly $\frac{1}{3}$ inch (8 mm.). Colour (in spirit) grey, with brownish markings.

This species, like *E. bicuspida*, has a wide circumpolar and boreal distribution; its range is from Siberia (Gulf of Yenissei) westward, probably throughout the Arctic seas, and southward on the east coast of North America to St. George's Banks, and on the west coast to British Columbia (Harger).

In the British-Museum collection there is only one specimen (a male) preserved in spirit, and believed to have come from the west coast of North America. In the Paris collection I have examined a considerable series of both sexes and different sizes from the sea of Mourman, near the Yenissei (Swedish Exped. of 1875-76).

In the Museum specimen and some of the Paris specimens the projecting postero-lateral angles of the first, partially coalescent, postabdominal segment form small lateral teeth.

Krøyer, in his description of this species, says, "*Epimera annulorum thoracicorum distincta, totum marginem annulorum lateralem obtegentia*," on which account only am I doubtful of the specific identity of his species with *S. nodulosa* of Harger, who, however, is probably right in attributing Krøyer's description to an error of observation.

Synedotea *Benedict*

~~EDOTIA~~ HIRTIPES.

Idotea hirtipes, M.-Edwards, *Hist. Nat. Cr.* iii. p. 134 (1840); Krauss, *Die südafrikan. Crust.* p. 61 (1843).

In this species the body is somewhat ovate, moderately convex, arcuated on the sides, evenly granulated above, with large inequalities on the sides of the thoracic segments at some distance from the lateral margins. Head with the anterior margin very slightly excavated, and with a semicircular curved impressed line posterior to its frontal margin, and another, nearly straight line near its posterior margin; its antero-lateral angles prominent and nearly right angles. The first three thoracic segments with an impressed curved line in the middle of the dorsal surface, and rounded at their postero-lateral angles; in none of the segments are these angles prolonged backward. Postabdomen short, rounded posteriorly, with a fissure on each side at its base, and with a small and shallow median emargination at its distal end. Eyes large. Antennules reaching nearly to the end of the penultimate joint of the antennæ, with their basal joints very small. Terminal joint of the peduncle of the antennæ longer than the preceding; flagellum with about 14-21 joints. Legs long, slender, hairy, and terminating in a long claw. Terminal plates of the opercular valves irregularly four-sided, being much narrowed at the distal end. Length of the largest specimen nearly 1 inch (25 mm.), breadth nearly $\frac{5}{12}$ inch (10 mm.).

The description (except as regards dimensions) is taken from Milne-Edwards's types.

There are in the British Museum several dried specimens from Simon's Bay, South Africa, collected on a sandy bottom in 4-7 fathoms; and others, without locality, collected by J. MacGillivray of H.M.S. 'Rattlesnake.'

In the Paris collection I have examined, besides four specimens from the Cape of Good Hope (types of M.-Edwards's description), others from the same locality (MM. Quoy and Gaimard), and several others, again, without particular locality.

Synedota, *Senecio*
IDOTIA HIRTIPES, VAR. LEVIDORSALIS. (Plate III. figs. 1 & 2.)

Two males are in the collection of the Museum from Jatiyama Bay, Japan, obtained at a depth of $6\frac{1}{2}$ fathoms, lat. $39^{\circ} 2' N.$, long. $189^{\circ} 50' E.$, presented by Dr. J. Gwyn Jeffreys, and collected by Capt. H. C. St. John, R.N., that differ so slightly from *I. hirtipes* that I cannot regard them as specifically distinct. The body is quite smooth in the larger example, and very nearly so in the smaller (which is of larger size than any specimen of the typical *I. hirtipes* that I have seen), and in both is of a

decidedly narrower-oval form; the antero-lateral angles of the head are perhaps not so prominent and more rounded; the eyes are smaller. Length of the largest example about 1 inch 1 line (28 millim.); breadth about $\frac{5}{12}$ inch (10 millim.). In this specimen the flagellum of the antennæ is about 30-jointed, but in the smaller example (length $\frac{5}{8}$ inch, 21 millim.) only about 21-jointed.

§§ *Antennæ very small, with the flagellum rudimentary; post-abdomen uniarticulate.* (Edotia.) *Edotia*

The species of this section may be distinguished by the following characters:—

a. *Dorsal surface of the body without a median line of tubercles.*

Lateral margins of the thoracic segments nearly straight and even; postero-lateral angles of the three posterior thoracic segments rounded; lateral teeth near the base of the postabdomen obsolete.

1. *E. triloba* (Say).

Lateral margins of the thoracic segments somewhat produced and angulated; postero-lateral angles of the three posterior segments rounded; subbasal lateral teeth of the postabdomen usually distinct.

2. *E. montosa* (Stimpson).

Lateral margins of the thoracic segments straight; postero-lateral angles of the three posterior segments acute; subbasal lateral teeth of the postabdomen distinct.

3. *E. magellanica* (Cunningham).

b. *Dorsal surface of the body with a median line of tubercles.*

Lateral margins of the thoracic segments nearly straight; postero-lateral angles of the three posterior segments subacute; subbasal lateral postabdominal teeth obsolete.

4. *E. tuberculata*, Guérin.

EDOTIA TRILOBA.

Idotea triloba, Say, *Journ. Acad. Nat. Sci. Philad.* i. p. 425 (1818); *M.-Edw. Hist. Nat. Cr.* iii. p. 134 (1840); *DeKay, Zool. of New York Fauna, Cr.* p. 43 (1844); *Leidy, Journ. Ac. Nat. Sci. Philad.* (ser. 2) iii. p. 150 (1855).

Jæra? *triloba*, White, *List Crust. Brit. Mus.* p. 97 (1847).

Epelys trilobus, Smith, *Rep. U.S. Fish Comm.* pt. i. p. 571, pl. vi. fig. 28 (1874); *Verrill, Amer. Journ. of Sci. and Arts*, (ser. 3) vii. p. 135 (1874); *id. Proc. Amer. Assoc.* p. 372 (1874); *id. Rep. U.S. Fish Comm.* pt. i. p. 370 (1874); *Harger, Pr. U.S. Nat. Mus.* ii. p. 160 (1879); *id. Rep. U.S. Fish Comm.* pt. vi. *Isopoda*, p. 358, pl. vii. figs. 42, 43 (1870).

This species, according to Harger, is of depressed-ovate form, and is marked by a depressed line on each side running from the posterior part of the head across the thoracic segments, nearer to their lateral margins than the median line (except perhaps on the last segment), thence to inclose a prominent hemispherical protuberance on the anterior part of the postabdomen; the body appears slightly roughened under a lens, or sometimes minutely hirsute. Head slightly dilated on the sides, with the antero-lateral angles produced, and with a pair of broad, low, triangular tubercles on its anterior part and a curved posterior depression. Thoracic segments with thick evident margins; first smallest, somewhat embracing the head, third and fourth largest, the last segment curving round the base of the postabdomen; all, according to the figure, have their antero- and postero-lateral angles rounded. Postabdomen shorter and broader than in *E. montosa*, with a rounded lobe near its base separated from the large posterior portion by a more or less evident incision; it is dorsally convex; lateral margins nearly even, and the distal is separated from the proximal portion by a broad and deep groove, which is continued to the margin, with only, at the most, traces of a tubercle on each side, the distal convexity being continued upon the obtusely-pointed apex. Eyes lateral and prominent. Antennules are longer than the head, and surpass the antennæ, with the basal joint but little enlarged. Antennæ shorter than the head, not surpassing the third antennular joint; the joints increasing in length to the fourth, fifth as long as the fourth, but more slender; bearing the minute slender rudiment of a flagellum, which is setose at the tip. Legs slender, more or less hairy, with the slender reflexible dactylus almost acicular in some of the posterior pairs. Colour uniform, dull. Length about $\frac{1}{4}$ inch (6 millim.), breadth rather over $\frac{1}{12}$ inch (2.3 millim.).

This species ranges, according to Harger, along the eastern coast of the United States from Egg Harbour, New Jersey, to Quahog Bay, Maine.

There is in the Museum collection but a single small example of this species, preserved dry, from Egg Harbour, New Jersey (T. Say). A second specimen that formerly existed in the collection is now destroyed. I have therefore taken the description from Harger's Report.

The stylet on the second pair of postabdominal appendages in the male is a little less elongated than in the next species.

EDOTIA MONTOSA.

Idotea montosa, Stimpson, *Marine Invert. Gd. Manan*, p. 40 (1853).
Epelys montosus, Harger, *Rep. U.S. Fish Commission*, pt. i. p. 571 (1874); *id. Pr. U.S. Nat. Mus.* ii. p. 161 (1879); *id. Rep. U.S. Fish Comm.* pt. vi. *Isopoda*, p. 359, pl. viii. figs. 44-47 (1880); *Verrill, Amer. Journ. of Sci. & Arts*, (ser. 3) vol. vii. p. 45 (1874); *id. Pr. Amer. Assoc.* p. 367 (1874); *id. Rep. U.S. Fish Comm.* pt. i. p. 270 (1874); *Smith & Harger, Tr. Conn. Acad.* iii. p. 3 (1874); *Whiteaves, Further Deep-sea Dredging G. St. Lawrence*, p. 15 “(1874).”

This species, according to Harger, closely resembles the foregoing, but is distinguished as follows:—The eyes are prominent; the antero-lateral angles of the head salient, and the tubercles on its upper surface more prominent than in *E. triloba*. The lateral margins of the thoracic segments, especially of the second, third, and fourth, are angulated and salient (in the middle, as the figure shows). Postabdomen more elongated than in the last species, its breadth being to its length as 5.5 to 10; the depression crossing it is partially interrupted at each side by a tubercle, which often projects, as seen from above, just behind the basal lobe, forming a shoulder to the large basal lobe. Stylet on the second pair of postabdominal appendages in the male attains the middle of the cilia. Colour as in the preceding, dull. Length nearly $\frac{5}{12}$ inch (10 millim.), breadth about $\frac{1}{8}$ inch (4 millim.).

It has been found as far north as Halifax and in the Bay of Fundy, and ranges southward to Long Island Sound.

Judging merely from the descriptions and figure I should much doubt if this species be really distinct from *E. triloba*; but having seen no specimens I cannot venture to unite the two forms.

Mr. Harger designates, under the name var. *hirsuta*, a few specimens collected in Whiting River, which are much more decidedly hirsute than is usual, both on the upper surface and the legs. In other respects they appear to be referable to *E. montosa*, although the posterior segments are rather less angulated at the lateral margin.

EDOTIA TUBERCULATA. (Plate III. figs. 3-6.)

Edotia tuberculata, Guérin-Méneville, *Icon. Règne Anim.*, Cr. p. 34 (1829-44); *Cunningham, Trans. Linn. Soc.* xxvii. p. 499 (1871).
Anisonotus falklandicus, White, *List Crust. Brit. Mus.* p. 97 (1847), *descript. nullâ*.

The body is ovate, convex, posteriorly acute, of very firm consistency. The head is tuberculate above, the elevations defined by deep grooves; its frontal margin is nearly straight, and is armed with two rounded tubercles in the middle, between the bases of the antennules; its antero-lateral lobes are rather prominent. The segments of the thorax have each a tubercle in the median dorsal line; a longitudinal depression on each side appears to mark the line of coalescence of the epimera; on the sides there is a less-marked but larger elevation, and the lateral margins are defined by a raised line; the postero-lateral angles of all the segments are but little prolonged backward, and are more or less rounded. The postabdomen does not equal in length the four posterior thoracic segments; it has a median elevation on the dorsal surface near its base, and three impressed lines appear to mark with more or less distinctness as many coalescent segments; beyond these the dorsal surface is nearly smooth, convex, with the lateral margins slightly sinuated and converging rapidly to the distal extremity, which is subacute. Eyes large, but with a small pigment-spot. Antennules rather widely separated at base, reaching beyond the end of the peduncle of the antennæ, with their basal joints very short and scarcely dilated. Antennæ with the peduncle slender; the last two joints nearly equal and each longer than either of the preceding; flagellum minute, 3-jointed, not half as long as the last peduncular joint, with its basal joint much longer than the two following, the last terminating in a pencil of rather long setæ. Legs slender, rather thinly clothed with hair, and with very long, slender, simple claws. The oblique raised line on the basal opercular plates extends over the posterior two thirds of their outer surface. The terminal plate is very narrow, triangulate, and acute at its distal end. Length of the largest example about $1\frac{1}{8}$ inch (30 millim.), breadth rather more than $\frac{5}{12}$ inch (11 millim.).

This species, as far as its range is at present known, is confined to the Straits of Magellan and the Falkland Islands.

There is in the Museum collection an example, preserved dry, from the Falkland Islands (W. E. Wright), designated by White *Anisonotus falklandicus*, and four males preserved in spirit from Gregory Bay, eastern Magellan Straits (Dr. R. O. Cunningham).

EDOTIA MAGELLANICA.

Edotia magellanica, *Cunningham, Trans. Linn. Soc.* xxvii. p. 499, pl. lix. fig. 6 (1871).

This apparently very distinct species differs from *E. tuberculata* as follows:—The body is relatively broader, less convex, the inequalities of the dorsal surface are less marked, and there is no median dorsal line of tubercles. The postero-lateral angles of the sixth and seventh thoracic segments are acute. The second coalesced postabdominal segment is partially distinct on the sides, where it is indicated by an acute tooth, and the terminal segment is not so much narrowed at its distal extremity. Length a little over $\frac{7}{12}$ inch (15 millim.), breadth about $\frac{3}{12}$ inch (7 millim.).

Five males, preserved in spirit, are in the collection, taken off Cape Espiritu Santo at the eastern entrance of the Straits of Magellan (Cunningham). This is the only recorded locality of this species.

§§§ *Flagellum of the antennæ obsolete; postabdomen biarticulate.*

(Desmarestia, Epelys.)

A minute rudimentary flagellum *may* possibly exist in the single species of this section; the antennæ are represented as terminating in a pencil of *setæ*.

This section of the genus includes the single species

EDOTIA? CHILENSIS.

Desmarestia chilensis, *Gay, Hist. de Chile, Zool.* iii. Cr. p. 287, pl. iv. fig. 1 (1849).

?*Epelys annulatus*, *Dana, Amer. Journ. of Sci. and Arts*, (ser. 2) vii. p. 427 (1849); *id. U.S. Expl. Exped.*, Cr. ii. p. 706, pl. xlvi. fig. 8 (1853), young?

In this species, as described by Gay (from whose long generic and specific descriptions and figure the following is adapted), the body is subovate, rugose, anteriorly dilated and rounded, narrowed posteriorly; a lateral and longitudinal sulcus running along each side of the dorsal surface of the thorax gives, as in other species of the genus, a trilobated appearance to the body. The head is small, broader than long; its anterior border is biemarginate to receive the antennules; its median portion is very acute, bent downward, with a longitudinal sulcus very distinct in the middle. Thorax fusiform, slightly convex above. Length of the four anterior segments nearly equal, of the three posterior much

shorter; all have concave anterior and posterior margins, with the subtriangular lateral plates (coalescent epimera?) broad, thick, narrowed anteriorly, separated one from another, directed forward in the three first segments and backward in the three last. Postabdomen short, broad, very convex, with subparallel sides at base, narrowed posteriorly, with rounded apex, composed of two distinct segments—the first short, the second very large, scutiform, longer than broad. Eyes placed at the sides of the head, near the postero-lateral angles, small, black in the young, diminishing and becoming almost invisible in the adult. Antennules and antennæ short, thick, subequal, inserted in front of the head, composed of six joints, the last four larger than the basal, equal in length, but diminishing in diameter from the first to the last, which is conical and ends in a pencil of hairs; the second antennæ are inserted beneath the first and in the same vertical line. Legs little-elongated, robust, cylindrical, all terminating in a strong reflexible claw; the legs of the first pair much shorter than the rest, which are subequal. Colour yellow, variegated with grey. Length 2 lines (in the plate $\frac{1}{4}$ inch, nearly 7 millim.).

The author, in his description, mentions two large lateral plates of the postabdomen which are applied to and cover in large measure the ventral surface, by which, no doubt, the plates of the operculum are intended.

The *Epeleys annulatus*, which I regard as probably the young of *Desmarestia chilensis*, is described by Dana as narrow, sub-elliptic. Head transverse, rather longer than first thoracic segment; frontal margin apiculate in the middle, a little concave on either side of the median prominence; antero-lateral angles rounded. Thoracic segments all short, prominent, transverse, nearly equal in length, the last four a little separated on each side, the three posterior sublunate (when viewed from above). Postabdomen 2-jointed; first segment very short, nearly obsolete, much narrower than the following; the second scutellate, triangular behind; the sides towards the base about parallel. Eyes minute, remote. Antennules a little shorter than the antennæ, 4-jointed, third joint a little longer than the others. Antennæ 5-jointed, not longer than the breadth of the head; joints short, the last three a little the longest. Legs subequal, similar in form, and terminating in a small claw; all rather short, the first pair the shortest. Length $\frac{1}{2}$ inch.

Chili, at Viña del Mar, three leagues north of Valparaiso (on the upper surface and embedded among the tentacles of an *Asterias*).

There is a slight pubescence and a few very short hairs at the extremity of the postabdomen; the opercular plates completely cover it below, and have hirsute margins. The antennæ are stoutish, and bear a few short hairs.

In the above citation I have combined in great measure Dana's generic and specific descriptions and subsequent remarks.

As in *E. chilensis*, the postabdomen is biarticulate, with the sides at base subparallel, head with a median frontal lobe, the first pair of legs the shortest.

CLEANTIS.

Cleantis, Dana, *Amer. Journ. of Sci. and Arts*, (ser. 2) viii. p. 427 (1849), xiv. p. 300 (1852); *id. U.S. Expl. Exped.* xiv. (Cr. 2) pp. 697, 707 (1853).

Erichsonia, Dana, *Amer. Journ. of Sci. and Arts*, (ser. 2) viii. p. 427 (1849), xiv. p. 300 (1852); *id. U.S. Expl. Exped.* xiv. (Cr. 2), pp. 697, 709 (1853); Harger, *Rep. U.S. Fish Comm.* pt. vi. *Isopoda*, p. 354 (1880).

Body more or less slender and elongated, narrow oblong or subelliptic, or very slender. Head transverse, with the eyes placed near to the lateral margins. Postabdomen with all the segments coalescent, or composed of two to five distinct segments. Antennules small. Antennæ well-developed, geniculate or non-geniculate, with the joints of the flagellum all consolidated and forming a single piece. Epimera distinct, small, some or all of them visible in a dorsal view. Legs slender, subsimilar; the penultimate joints of the three anterior pairs not dilated. Opercular valves nearly as in *Idotea*.

§ *Postabdomen with all its segments coalescent.* (Erichsonia.)

The species of this section may apparently be distinguished as follows:—

Elliptical, broadest in the middle: head with two distinct frontal tubercles; first and second thoracic segments triangulate on the sides.

1. *C. angulata* (Dana).

Suboblong: head with a bifid tubercle on its upper surface; thoracic segments laterally more or less angulated.

2. *C. filiformis* (Say).

Narrow-linear: head without a dorsal tubercle; thoracic segments with the lateral margins straight.

Erichsonia
CLEANTIS ANGULATA.

3. *C. attenuata* (Harger).

Erichsonia angulata, Dana, *Amer. Journ. of Sci. and Arts*, (ser. 2) viii. p. 427 (1849); *id. U.S. Expl. Exp.* xiv. Cr. ii. p. 710, pl. xiv. fig. 10 (1853).

Is described by Dana as long elliptic; body a little convex, front excavated; head with two tubercles on the anterior margin and with two crenations on each side, in the posterior of which the eyes are situated. Head and thoracic segments angulated-transverse; four anterior segments of thorax with a tubercle at the middle, first and second triangular in outline on either side, third and fourth polygonal, the fourth the broadest and longest. Postabdomen uniaarticulate, oblong, subscutellate, margin sinuous, broadest near apex, extremity triangulate obtuse. Eyes of moderate size. Antennules not one third the length of the antennæ. Antennæ longer than half the body, geniculated, 6-jointed; last three joints subequal, penultimate shortest, the last obtuse, clavate, and pubescent. Legs subequal, two posterior and two anterior shortest, basal joints stout and generally tuberculated. Epimera angular and visible from above, excepting the third and fourth pairs, the third is sometimes apparent in an upper view. Colour brown or yellowish brown; penultimate joint of legs with a black or brownish transverse band. Length $\frac{1}{2}$ inch.

Rio Janeiro. Among seaweed in the harbour; found with *Caprellæ*.

The above description is adapted from Dana's generic and specific descriptions and observations.

In the specimen observed by Dana the two frontal tubercles were situated a little to the left of the centre, the right antenna was a little larger than the left, and no tubercles were seen on the basal joints of the anterior legs.

Erichsonia
CLEANTIS FILIFORMIS. (Plate III. figs. 7 & 8.)

Stenosoma filiformis, Say, *Journ. Acad. Nat. Sci. Philad.* i. p. 424 (1818); *M.-Edw. Hist. Nat. Cr.* iii. p. 134 (1840); *DeKay, Zool. New York Fauna*, vi. Cr. p. 44 (1844).

Idotea filiformis, White, *List Crust. Brit. Mus.* p. 95 (1847).

Erichsonia filiformis, Harger, *Rep. U.S. Fish Comm.* pt. i. p. 570, pl. vi. fig. 26 (1874); *id. Pr. U.S. Nat. Mus.* ii. p. 160 (1879); *id. Rep.*

U.S. Fish Comm. pt. vi. *Isopoda*, p. 355, pl. vii. figs. 38-41 (1880);
Verrill, Rep. U.S. Fish Comm. pt. i. p. 316 (1874).

Body slender and elongated, strongly serrated in a lateral outline in a dorsal view, with nearly parallel sides and a median row of prominent tubercles, one large and bifid on the head, and one on each thoracic segment. Head quadrate. In the first two segments of the thorax the postero-lateral angles are salient and much elevated, in the third and fourth both antero-lateral and postero-lateral angles are salient but not elevated; in the last three segments only the antero-lateral angles are produced. Postabdomen about one third the length of the body, with a more or less evident tooth on each side near the base, and dilated and obtusely triangular at apex. Eyes prominent. The antennules reach beyond the middle of the third antennal segment. Antennæ more than $\frac{1}{2}$ as long as the body, with the basal segment very short, next two or three times as long as the first, third to fifth nearly cylindrical, and the last or flagellar segment the longest and slightly clavate, bristly-hairy towards the apex. The epimera are visible from above in a dorsal view in front of the antero-lateral angles of the first and second segments, and behind the antero-lateral angles in the three posterior segments. The operculum is a little more vaulted than in *C. attenuata* and shorter, the basal plate is less than three times as long as broad, its terminal plate is triangular. Colour usually a dull neutral tint, without bright markings, but sometimes more or less variegated with brown or reddish, fading in alcohol. Length about $\frac{5}{12}$ inch (11 millim.), breadth rather under $\frac{1}{8}$ inch (3.4 millim.).

This species, Mr. Harger observes, was originally described from Great Egg Harbour, New Jersey. It is not uncommon along the shores of Long Island Sound, and as far east as Vineyard Sound, Massachusetts, but has not yet been found north of Cape Cod.

There is in the Museum collection a single dried specimen from Egg Harbour (J. Say).

In a specimen in the Paris collection from Gloria (Brazil?) (MM. Castlenau & Deville) which I refer with much hesitation to this species, there is a single strong bilobated tubercle on the upper surface of the head; there is a distinct median dorsal tubercle only on the first thoracic segment, the three following being carinated rather than tuberculated; the angulated epimera

of the first and second thoracic segments are visible in a dorsal view below the lateral margins of the segments, which project laterally and upwards and are themselves triangulate. The terminal postabdominal segment is sinuated, scarcely toothed on the sides. The eyes are situate apparently on the postero-lateral lobes of the head; the antennules scarcely reach to the base of the antepenultimate joint of the antennæ, whose terminal joint is geniculate, *i. e.* bent outwardly at an angle with the preceding joint. Distal opercular valves triangulate, with the apex subacute. Length about $\frac{1}{3}$ inch ($8\frac{1}{2}$ millim.).

Erichsonia
CLEANTIS ATTENUATA.

Erichsonia attenuata, Harger, *Rep. U.S. Fish Comm.* pt. i. p. 570, pl. vi. fig. 27 (1874), pt. vi. *Isopoda*, p. 356, pls. vi. & vii. figs. 36, 37 (1880); *id. Pr. U.S. Nat. Mus.* ii. p. 160 (1879); Verrill, *Rep. U.S. Fish Comm.* pt. i. p. 370 (1874).

This species, according to Mr. Harger, is at once distinguished from the preceding by its slender form and regular outline. The body is smooth throughout and about six times as long as broad, without prominent irregularities, and narrowly linear in outline. The thoracic segments increase in size to the third, which is equal to the fourth, and the last three are of a gradually decreasing size. The postabdomen presents only slight traces of a lateral tooth near its base, and is but little dilated towards the tip. The eyes are small and black. The antennules are short, slightly surpassing the second antennal joint. The antenna are stout and smoother than in the preceding species. The epimera are nowhere conspicuous, but may usually be seen from above, especially in the posterior segments. The operculum is longer than in the preceding species, the basal plate more than three times as long as broad, and the terminal plate elongated, triangular, and obtuse. Specimens preserved in spirit are of a light greyish yellow with minute black punctulations. Length rather more than $\frac{7}{12}$ inch (15 millim.), breadth a little over $\frac{1}{12}$ inch ($2\frac{1}{2}$ millim.).

It was abundant, according to Mr. Harger, at New Jersey, Great Egg Harbour, and has also been found at Noank, Connecticut, U. S. A.

I have seen no specimens.

§§ *Postabdomen consisting of more than one segment, distinct, and visible in a dorsal view.* (Cleantis.)

The species may be distinguished as follows:—

Postabdomen 2-jointed, its distal end subtriangulate.

1. *C. isopus*, Grube (ined.).

Postabdomen 3-jointed, its distal end subtruncated or slightly excavated.

2. *C. linearis*, Dana.

Postabdomen 5-jointed, its distal end deeply emarginate.

3. *C. granulosa*, Heller.

CLEANTIS ISOPUS. (Plate III. figs. 9–11.)

Cleantis isopus, Grube (MS. in Coll. Brit. Mus.).

The body has straight and subparallel sides, and is rather convex in the middle line; the head has a small transverse linear impression near its posterior margin; its anterior margin is somewhat excavated, and its antero-lateral angles nearly right angles. The anterior margin of the first segment of the body is concave; its antero-lateral angles are rounded and produced along the sides of the head almost as far as the eyes, which are situated in the middle of the lateral margins. The following segments of the body are all of nearly similar form and equal length, and are produced neither at the antero-lateral nor at the postero-lateral angles. The postabdomen is composed of two distinct segments, the first being very short; the terminal segment is scarcely longer than broad, convex above at base, with the sides at first nearly parallel, but near to the distal extremity suddenly convergent, so that the apex is very broadly and obtusely triangulate; it is marked on each side near the base with sutures indicative of two coalescent segments. The antennules are nearly as in *Idotea*; the antennæ rather more than half as long as the animal, with five joints visible in a dorsal view, the first two of which are short, the two next longer and subequal, and the last (which takes the place of the flagellum in *Idotea*) yet rather longer, and clothed with a few scattered short hairs. The epimera are almost linear, and in the first three segments extend along only half the length of the lateral margins; in the following segments they become successively longer. The legs are very slender; the fourth pair are, however, but little shorter than the preceding; the claws of all the legs are slender and slightly curved. The terminal opercular plates are three-sided, with the outer margins oblique and

slightly rounded to the distal extremity. Length of the largest example (a male) about $\frac{11}{2}$ inch (24 millim.).

Ojica, Goto Island, lat. $33^{\circ} 12' 30''$ N., long. $129^{\circ} 5'$ E.: a male and two females were collected at low-water mark.

I am enabled to identify these specimens with the species designated (but, I believe, not yet described) as *Cleantis isopus* by Dr. Edward Grube, by comparison with two examples kindly presented to the British Museum by that gentleman; and I gladly avail myself of his specific name. Dr. Grube's specimens are from Chefoo.

CLEANTIS LINEARIS.

Cleantis linearis, Dana, *Amer. Journ. of Sci. and Arts*, (ser. 2) viii. p. 427 (1849); *id. U.S. Expl. Exp., Cr.* ii. p. 708, pl. xlv. fig. 9 (1853).

In this species, according to Prof. Dana (from whose later work the description is taken) the body is very narrow-linear, and fully six times as long as wide. Head subtriangular behind and obtuse, set into the following segment; front truncate or a little excavate. Thoracic segments somewhat transverse; fourth, fifth, and sixth segments longest, the fourth nearly quadrate. Post-abdomen 3-jointed; the first two segments very short, transverse; the third nearly twice as long as broad, having a suture near the base, the sides nearly parallel, postero-lateral angles truncate, apex truncate or slightly excavate. Eyes situated near the angles of the head. Antennules very small, not half the length of the antennæ, with their basal joints rather stout; third shortest, obconical; the fourth as long as the second and third together. Antennæ rather stout, shorter than half the body, 5- to 6-jointed, not geniculate; last four joints each oblong; last joint shorter than the preceding, elongate-ovate, pubescent. The epimera (in the figure) are not visible in a dorsal view. Legs compressed, with the last joint the longest; third pair twice as long as the first; fourth pair very much shorter than the third; the last four pairs gradually increase in length. Claw with a short spine beneath the apex. Colourless when obtained. Length 9 or 10 lines.

N. Patagonia, Rio Negro (from the stomach of a *Silurus*).

I have seen no specimens.

The *Idotea angustata* of Nicolet (*Crust. in Gay's Chilc, Zool.* iii. p. 258, pl. iii. fig. 4, 1849) has the body narrow and elongated;

the four anterior segments of the thorax have the posterior margin narrower than the anterior, with the antero-lateral angles somewhat prolonged forward; the last three segments, on the contrary, have the anterior margin narrower than the posterior, and the postero-lateral angles enlarged and prolonged backward. Postabdomen rather more than one fourth the length of the animal, with three very distinct segments; the second segment with two rather obscure transverse sulci. Eyes red, occupying the antero-lateral angles of the head. Antennules approximated at base, and more slender than the antennæ, which are brownish or yellow, and reach only to the third thoracic segment. Legs yellowish. Colour brownish, mingled with pale yellow, and with a longitudinal median line, which occupies the whole length of the thorax. Length about 4 lines (in the plate $\frac{5}{12}$ inch, about 10 millim.).

In the figure the sides of the body are nearly parallel, and there are six distinct postabdominal segments, the first five being very short, and the last semicircularly rounded at its distal end. The antennæ are 5-jointed, without a distinct flagellum, the last joint similar to the preceding, on which account I place the species, provisionally at least, in *Cleantis*. As the name *Idotea angustata* has been preoccupied by Lucas, I would propose to designate this species, if distinct, *Cleantis Gayi*. It may be identical with *Cleantis linearis*, Dana, in which, however, the angles of the thoracic segments are less prominent, and the terminal segment truncated or even slightly excavated at its distal extremity. If, on the other hand, a distinct flagellum exist, the species must be placed in *Idotea*—*Idotea prismatica*.

CLEANTIS GRANULOSA.

Cleantis granulosa, Heller, *Verhandl. zool.-bot. Vereins, Wien*, xi. p. 497 (1861); *id. Cr. in Reise der Novara*, p. 132, pl. xii. fig. 2 (1865).

Body very narrow, broadest at the two anterior segments, narrowing very slightly from before backward, with the postabdomen as broad as the posterior margin of the thorax. Frontal margin of the head slightly emarginate in the middle; its posterior margin convex. Thoracic segments of equal length, broader than long, strongly convex, with the sides perpendicular. The antero-lateral angles of the first segment are only slightly prolonged forward. The postabdomen consists of five segments, of which the two anterior are shaped like the preceding thoracic

segments, being as broad as they, but much shorter, with the postero-lateral angles rather prominent; the two following segments are very narrow-transverse. The terminal segment is very long, very convex in the middle, abruptly deflexed toward the lateral and posterior margins, with the lateral margins parallel, directed somewhat inward toward the distal extremity; the posterior margin deeply excavated. The eyes are inserted behind the antero-lateral angles. Antennules very short, reaching to the end of the second antennal joint, with the terminal joint elongate-conical, and quite as long as the preceding cylindrical joint. The antennæ, when retracted, reach to the posterior margin of the fourth thoracic segment, and are 6-jointed; the joints decrease in thickness, but increase in length, from the base to the distal extremity; the basal joint is short and annular, the second and third joint with a dentiform process on its inner and upper distal margin and with a notch on the underside. Legs as in *C. linearis*. Epimera narrow, elongate-triangular, posteriorly acute. On the second, third, and fourth segments they appear shorter than, and occupy the anterior half of the lateral margins; on the three following segments they are anteriorly distinctly broader, occupy the whole of the lateral margins, and posteriorly even project somewhat beyond them. The whole surface of the body is finely granulated. Colour appears to be light brownish; legs and antennæ yellowish grey. Length a little under $\frac{1}{2}$ inch (22 millim.).

St. Paul.

As I have seen no specimens of this species, the description is taken from Prof. Heller's work.

The following are species which have been referred to the *Idoteidæ*, but belong to other families:—

Idotea psora (Linn.), Fabr.; *Idotea physodes* (Linn.), Fabr.; *Idotea albicornis*, Fabr.; *Idotea aquatica* (Linn.), Fabr.; *Idotea scopulorum* (Linn.), Fabr.; *Idotea penicillata*, Risso, on which M. Risso subsequently founded the genus *Oliska*.

The *Idotea euplectellæ*, Landois, Jahresb. Westf. prov. Ver. p. 42 (1878), inhabits *Euplectella aspergillum*, and is, according to Dr. Bertkau (Arch. f. Nat. Band xlvi. p. 272, 1880), very probably identical with *Cirolana multidigitata*. I have not seen Landois's description.

The species of the curious blind genus *Cæcidotea*, Packard, from

the Wyandotte and Mammoth Caves, which also inhabit wells in Orleans, Indiana, do not, as Dr. Packard at first supposed, belong to the *Idoteidæ*, but to the *Asellidæ*; and the so-called egg-sacs are uropoda (see Packard, 5th Annual Rep. of Peabody Acad. of Sciences, 1873, p. 94, and S. I. Smith, Rep. U.S. Fish Commission, pt. ii. p. 661, 1874). Specimens apparently belonging to *Cæcidotea stygia* are in the British Museum from the Kentucky Caves (G. Lewis, Esq.); but they are dried and in imperfect condition, and appear to have lost the uropoda.

The genus *Slabberina* of v. Beneden (Mém. Acad. Bruxelles, xxxiii. p. 88, 1861) was placed by this author in the *Idoteidæ*, but is without the characteristic operculum of the family; it is apparently synonymous with *Eurydice*, Leach.

The following species are too insufficiently characterized for me to assign to them their exact position in the system; probably some of them may even not belong to this family:—*Idotea* (*Cymothoa*) *americana*, Fabr.; *Idotea chelipes* (Fabr.), Latr.; *Idotea fasciata*, Latr.

Hope, Cat. Crust. Ital. p. 26 (1851), refers to two species of which I have seen no descriptions—*Stenosoma denticulatum*, Risso, from Nice, and *Leptosoma obtusicauda*, Costa, from Naples.

EXPLANATION OF THE PLATES.

PLATE I.

- Fig. 1. Dorsal view of head and antennal region of *Glyptonotus entomon* (Linn.), showing the position of the dorsally situated eyes, and the form of the lateral cervical lobes, of the antennules, antennæ, &c. $\times 1\frac{1}{2}$ diam.
2. Opercular valve, or modified uropod, of the same, viewed from the inner side, showing the position of the minute outer ramus, which is overlapped and concealed by the larger inner ramus. Nat. size.
3. Dorsal view of head of *Glyptonotus Sabini* (Kröyer), showing the structure of the antero-lateral cervical lobes, eyes, antennules, and antennæ, as in fig. 1. $\times 1\frac{1}{2}$ diam.
4. Opercular valve (modified uropod) of the same, showing the form of the inner and outer rami, as in fig. 2. Nat. size.
5. *Glyptonotus Sabini* (Kr.), young individual from Picton-Rock Glacier, $\times 2$ diam.
6. *Idotea Whymperi*, n. sp., dorsal view, considerably magnified.
7. Outer view of one of the opercular valves of the same, considerably magnified.
8. *Idotea ochotensis*, Brandt, dorsal view of an adult specimen from Yedo Island, Japan, $\times 1\frac{1}{2}$ diam.
9. Maxillipede of the same, considerably magnified.

- Fig. 10. Outer view of opercular valve of the same, magnified.
 11. *Idotea lacustris*, Thomson?, from a specimen from Port Henry, Straits of Magellan, $\times 4$ diam.
 12. Opercular valve of the same, $\times 7$ diam.

PLATE II.

- Fig. 1. *Idotea Whitei*, Stimpson?, dorsal view (from a specimen in the collection of the Paris Museum), $\times 2$ diam.
 2. Lateral view of the same, showing the form of the epimera, $\times 2$ diam.
 3. Opercular valve of the same, outer view, further magnified.
 4. *Idotea indica*, M.-Edwards, dorsal view (from the type in the Paris collection), $\times 1\frac{1}{2}$ diam.
 5. Opercular valve of the same, $\times 2$ diam.
 6. *Idotea Peronii*, M.-Edwards, dorsal view (from a specimen from Flinder's Island), $\times 1\frac{1}{2}$ diam.
 7. Opercular valve of the same, outer view, $\times 2$ diam.
 8. *Idotea lobata*, White (ined.), dorsal view (from the unique type example in the collection of the British Museum), $\times 4$ diam.
 9. Opercular valve of the same, outer view, $\times 10$ diam.

PLATE III.

- Fig. 1. *Edotia hirtipes*, M.-Edw., var. *lævidorsalis*, n. var. (from a specimen from Jatiyama Bay, Japan), $\times 1\frac{1}{2}$ diam.
 2. Opercular valve of the same, outer view, $\times 3$ diam.
 3. *Edotia tuberculata*, Guérin-Méneville, dorsal view, $\times 2$ diam.
 4. Maxillipede of the same, greatly magnified.
 5. Greatly magnified view of part of the antenna of the same, showing rudimentary flagellum.
 6. Opercular valve of the same, outer view, considerably magnified.
 7. *Cleantis (Erichsonia) filiformis* (Say)?, dorsal view (from a specimen in the Paris collection), greatly magnified.
 8. Opercular valve of the same, dorsal view, considerably magnified.
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